DOCUMENT RESUME

ED 388 175 HE 028 718

TITLE	Military Physicians: DOD's Medical School and Scholarship Report to the Congressional Requesters.
INSTITUTION	General Accounting Office, Washington, DC. Health, Education, and Human Services Div.
REPORT NO	GAO/HEHS-95-244
PUB DATE	Sep 95
NOTE	95p.
AVAILABLE FROM	U.S. General Accounting Office, P.O. Box 6015, Gaithersburg, MD 20884-6015 (first copy free, additional copies: $2; orders for 100 or more copies to be mailed to a single address discounted 25 percent).
PUB TYPE	Legal/Legislative/Regulatory Materials (090) -- Statistical Data (110)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	*Cost Effectiveness; Costs; Educational Quality; Higher Education; Labor Turnover; *Medical Education; Military Personnel; Military Schools; *Military Service; Military Training; *Physicians; Scholarships
IDENTIFIERS	Department of Defense; *Uniformed Services Univ of the Health Sciences MD

ABSTRACT

In response to congressional mandate and in light of proposals to close the Uniformed Services University of Health Sciences (USUHS), this study reviewed issues related to USUHS and other means through which the Department of Defense (DOD) obtains physicians. In particular the study examined the cost of obtaining military physicians from all sources, the quality of the medical education at USUHS, how physicians are trained to meet the needs of military medicine, and retention rate patterns among the accession programs. The study used findings from prior studies; analyzed data from the DOD, the services and USUHS; and held discussions with military and civilians officials. Results included the following: (1) USUHS is the costliest physician source on a per graduate basis; (2) university costs are comparable to scholarship cost based on expected years of service and all federal costs; (3) USUHS students receive extensive military medical readiness training, but its impact is unclear; (4) with regard to retention, data suggest that USUHS are likely to provide DOD with a cadre of experienced physician career officers; and (5) scholarship program physicians, who comprise the majority of new physician accessions, are retained in the military for shorter periods than USUHS graduates. Appendixes contain information on research methodology and background data. (JB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

HE

United States General Accounting Office

GAO

Report to the Congressional Requesters

September 1995

MILITARY PHYSICIANS

DOD's Medical School and Scholarship Program

ED 388 175

M602D 71D

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it

☐ Minor changes have been made to improve reproduction quality

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

GAO/HEHS-95-214

BEST COPY AVAILABLE

GAO

United States
General Accounting Office
Washington, D.C. 20548

Health, Education, and
Human Services Division

B-265758

September 29, 1995

The Honorable Strom Thurmond
Chairman
The Honorable Sam Nunn
Ranking Minority Member
Committee on Armed Services
United States Senate

The Honorable Floyd D. Spence
Chairman
The Honorable Ronald V. Dellums
Ranking Minority Member
Committee on National Security
House of Representatives

Enclosed is our report, Military Physicians: DOD's Medical School and Scholarship Program (GAO/HEHS-96-244), which was mandated by the National Defense Authorization Act for Fiscal Year 1995. This report provides information on the Department of Defense's Uniformed Services University of the Health Sciences and the Health Profession Scholarship Program. Among other things, the report addresses the costs of obtaining physicians through each of these sources and how physicians obtained through each are prepared to meet the special needs of military medicine.

We are sending copies of this report to the Chairman and Ranking Minority Member of the Senate Committee on Armed Services' Subcommittee on Personnel, Senator Russell D. Feingold, other appropriate congressional committees, the Secretary of Defense, and other interested parties. We also will make copies available to others on request. If you have any questions about this report, please call George F. Poindexter, Assistant Director, at (202) 512-7213. Other major contributors to this report are Lawrence L. Moore, William A. Schechterly, Michael C. Williams, and Mona M. Zadjura.

David P. Baine

David P. Baine
Director, Health Care Delivery
and Quality Issues

Executive Summary

Purpose

In the 2 decades since its legislative establishment, proposals have been made to close the Uniformed Services University of the Health Sciences, the Department of Defense's (DOD) medical school in Bethesda, Maryland. Those who propose closing the University assert that DOD's need for physicians can be met at a lower cost using physicians educated at civilian medical schools. Those who propose retaining the University assert that it is needed to provide a stable cadre of physicians trained to meet the unique demands of military medicine.

Following proposals in 1994 to close the University, the Congress mandated that GAO review issues related to the University and the other means through which DOD obtains physicians.[1] Among other things, GAO was directed to examine (1) the cost of obtaining military physicians from all sources, (2) the quality of the medical education provided at the University, (3) how physicians are trained to meet the needs of military medicine, and (4) retention rate patterns among the accession programs.

GAO reviewed prior studies; analyzed data from DOD, the services, and the University; and held discussions with military and civilian officials to respond to these issues.

Background

In 1972, Public Law 92-426 established two complementary physician accession sources: the Health Profession Scholarship Program and the University. Under the scholarship program, DOD pays tuition and fees, plus a monthly stipend for students enrolled in civilian medical schools. In return, the students incur an obligation to serve a year of active duty service for each year of benefits received, with a 2-year minimum obligation. Upon graduation, most scholarship program participants (regular program participants) go on active duty and begin graduate medical education (GME) in military hospitals. Other scholarship program participants (deferred program participants) are granted deferments while they pursue civilian GME. In 1994, 987 scholarship program participants graduated from medical school.

Students at the University enter active military service as medical students, receive the pay and benefits of an officer at the O-1 level, and incur a 7-year service obligation. In 1994, 155 medical students graduated from the University.

[1]The National Defense Authorization Act for Fiscal Year 1995, (P.L. No. 103-337, §922(c)(1)(4)).

The primary responsibilities of military physicians (regardless of accession source) are to provide medical support to the forces who carry out DOD's operational missions and other active duty personnel. They also provide health care to nonactive duty beneficiaries. To prepare physicians for the practice of military medicine, the University augments the traditional 4-year medical school education with readiness training; scholarship program graduates attend training courses offered by the services.

In 1990, the DOD Inspector General reported on the adequacy of the University's management oversight and control of its diverse operations. The Inspector General's report recommended corrective actions in six categories of those operations and closed the inspection in October 1994 based on the University's corrective actions. Appendix IV contains a detailed discussion of the Inspector General's findings and the University's actions.

Results in Brief

Determining the most cost effective way to educate and retain military physicians depends on the cost elements included and the unit of analysis used to measure cost. By most measures, the University is a more costly way to educate and retain military physicians. For example, on a per graduate basis, GAO's analysis shows that the University is the most expensive source for educating and retaining military physicians when considering DOD and total federal costs. When costs are distributed over the expected years of military physicians' service, the University remains more costly when DOD costs are considered. However, when all federal costs are considered, the University is nearly equal to the cost of the regular scholarship program and lower than the cost of the deferred scholarship program. This difference occurs because University graduates are expected to have much longer military careers and the University receives much less non-DOD federal support than civilian medical schools.

GAO's analysis shows that the University provides a medical education that compares well with that of other U.S. medical schools. Traditional measures of quality place the University within the midrange of medical schools nationwide and its graduates at or above other military physicians. In addition, to help meet standards required for accreditation as an academic institution, the University provides education and training for other health care and related professions and engages in research, consultation, and archival activities. These activities, which do not directly contribute to the education of military physicians, involve University faculty and staff. University officials believe that DOD would continue to

conduct these activities even if the University is closed and estimated their value to be about $18.6 million—a figure which GAO did not validate.

University graduates begin their military medical careers with more readiness training than their peers, but the significance of the additional training is unclear. The commanders of military medical units that GAO contacted believe that University graduates are, at least initially, better prepared than other physicians to address the special needs of military medicine. However, due to the absence of objective measures, no conclusive evidence exists that University graduates are better prepared to meet the needs of military medicine than their civilian-educated peers. The services have not assessed the impact of readiness training and a thorough assessment is needed to determine the type and amount of such training that military physicians need.

GAO's review of DOD retention data suggests that University graduates are likely to provide DOD with a cadre of experienced physician career officers. Scholarship program physicians, who comprise the majority of new physician accessions, are retained in the military for shorter periods, on average, than University graduates.

However, given the changes in operational scenarios and DOD's approach for delivering peacetime health care, new assessments of the military's physician needs and the means to acquire and retain such physicians are in order. For example, if DOD continues to need a cadre of experienced career physicians, alternative strategies such as an additional scholarship option with a longer service obligation could be considered as a potentially less expensive way to increase the length of selected military physicians' careers.

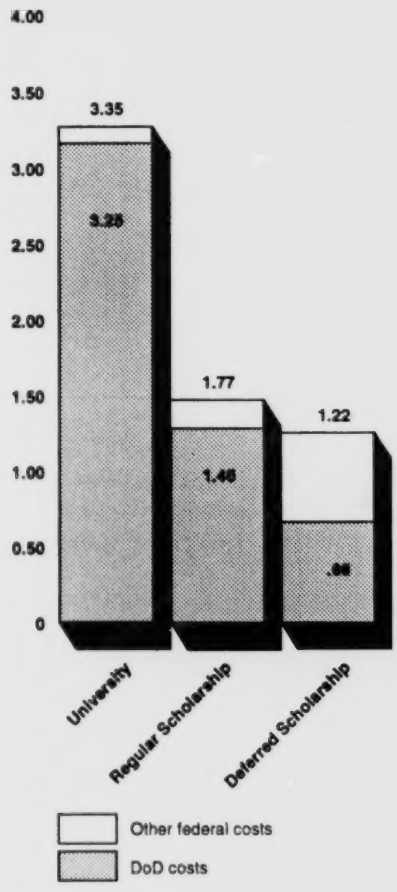
As the Congress makes decisions regarding both physician accession programs, it will need information not only about the programs' relative costs but also about their effects on the short- and long-term requirements for military physicians and the value of the other University activities.

Principal Findings

The University Is the Costliest Physician Source on a Per Graduate Basis

GAO's analysis shows that on a per graduate basis, the University is the most expensive source of military physicians when considering DOD costs and total federal costs. With DOD education and retention costs of about $3.3 million, the cost of a University graduate is more than 2 times greater than the $1.5 million cost for a regular scholarship program graduate and about 5 times greater than the $659,000 cost for a deferred scholarship program graduate. When all federal costs are considered, the cost of a University graduate is about $3.4 million, about 1.9 times more costly than regular scholarship program graduates ($1.8 million) and more than 2.7 times more costly than deferred scholarship program graduates ($1.2 million). Figure 1 depicts these relationships.

Figure 1: Per Graduate Costs for University and Scholarship Program Participants

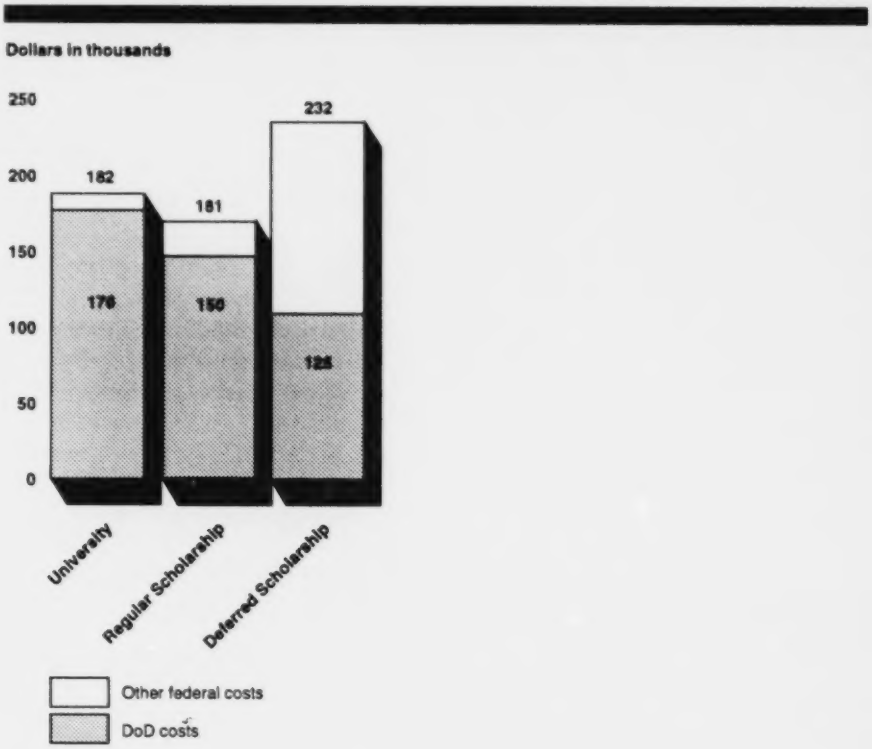


University Costs Are Comparable to Scholarship Costs Based on Expected Years of Service and All Federal Costs

The difference in costs between the University and the scholarship program narrows when costs are amortized over the expected years of military service for each group because University graduates are expected to serve nearly twice as long as their regular scholarship program peers and more than three times as long as deferred scholarship program physicians.[2] On an expected years of service basis, DOD's cost to educate and retain a University graduate is about $176,000 compared with about $150,000 for the regular scholarship program and about $125,000 for the deferred scholarship program. However, when total federal costs are amortized over the expected years of military service, the costs of University graduates are more comparable to scholarship program physicians because the University receives less non-DOD federal support than civilian medical schools. University graduates are expected to serve for about 18.5 years, on average, resulting in a per year federal cost of about $182,000. Regular scholarship program physicians, expected to serve for 9.8 years, on average, have an annual federal cost of about $181,000, and deferred scholarship program physicians, expected to serve for 5.3 years, on average, have an annual federal cost of about $232,000. Figure 2 shows DOD and federal costs for physicians from each source based on expected years of military service.

[2]Expected years of service is a calculation based on DOD retention estimates for physicians from each program multiplied by the number of graduates from each program in 1994. DOD's retention estimates are projections based on historical retention data for each program and the experience of all military physicians. Actual years of service for physicians from each accession source may be greater or less than these projections.

Figure 2: Per Expected Year Costs of Service for University and Scholarship Program Participants



The University Provides Quality Education and Other Benefits to DOD

The University's School of Medicine is fully accredited and its students have undergraduate grade point averages and admission test scores that fall within the middle of the ranges for such statistics for all medical schools. Post-graduate measures, such as pass rates for the medical license examination and graduates' performance in their first year of GME, indicate that the results for University graduates are equivalent or slightly better than those of other military physicians.

To help meet accreditation standards and to advance the practice of military medicine, the University engages in several activities in addition to operating its School of Medicine. These activities include providing overseas medical personnel required continuing medical education, serving as the academic affiliate for several military graduate medical education programs, and offering graduate education programs for allied health professionals. The University has established research and archival programs in such areas as casualty care, preventive medicine, and psychiatric responses to trauma and disaster. University officials point out that if the University were not performing these roles, other DOD components would have to be tasked to carry them out.

University Students Receive Extensive Medical Readiness Training, but Its Impact Is Unclear

The University provides training in the special needs of military medicine as an integral part of its medical school curriculum. By the time University students graduate and begin active duty, they have received at least 784 hours of medical readiness training. Other new military physicians take specific medical readiness training courses once they are on active duty; however, the initial training they receive is less extensive than that provided to University graduates.

Even though graduates of the University begin their military medical careers with more initial readiness training than other new military physicians, the significance of the additional training is unclear. While the commanders of military medical units that GAO contacted perceive that physicians from the University are at least initially better prepared than their civilian educated peers for military medicine, objective measures of the effects of the University or other approaches to medical readiness training are not available. DOD has not compared the effectiveness of the University approach with other initial readiness training offered by the services. Recent deployments have not comprehensively tested the individual readiness capabilities of military physicians, and such capabilities are not routinely assessed in peacetime.

Retention Rate Patterns for Graduates Consistent With Program Objectives

DOD's need for physicians has changed as a result of the end of Cold War scenarios, the emergence of regional threats, and the overall downsizing of the military in response to budget deficits. In addition, DOD has dramatically changed its approach to delivering medical care to military beneficiaries during peacetime by relying more heavily on civilian providers to deliver much of that care. Although the Department is currently reevaluating its future need for physicians, it has not reached final conclusions about the number of physicians needed nor the optimal length of time that physicians should serve.

GAO's analysis of DOD retention data shows that University graduates are likely to meet DOD's needs for an experienced cadre of military physicians while scholarship program graduates generally have shorter careers. Factors such as age, marital status, compensation, nonphysician duties, and working conditions have been associated with physician retention. A key factor in the longer retention of University graduates, however, appears to be their longer pay-back obligation. If the University were closed, the scholarship program might need to be revised to encourage or require some scholarship students to stay longer in the military. For example, one approach might be a scholarship option with a longer service obligation, including enhanced military readiness training and, perhaps, additional benefits.

Matter for Congressional Consideration

The Administration's National Performance Review has proposed that the University be closed. This proposal has presented the Congress with difficult policy decisions regarding the need for a cadre of physicians who are likely to become career military officers and the most appropriate means of retaining those physicians.

As the Congress makes those decisions, it may wish to consider requiring DOD to justify both the University and the scholarship program in the context of DOD's specific short- and long-term requirements for military physicians, the role of the University and the scholarship program in satisfying those requirements, and their relative costs.

Agency Comments

On September 15, 1995, GAO met with the Assistant Secretary of Defense, Health Affairs, and other DOD officials and with the President of the University and his top staff to obtain their comments on a draft of this report.

The Assistant Secretary stated that the report presents a great deal of relevant, factual data and reflects a significant research effort. In response to GAO's matter for congressional consideration, however, the Assistant Secretary stated that the Department does not believe that additional justification is needed for the University and scholarship program. Both the Assistant Secretary and University officials expressed concerns regarding several presentational issues, such as the use of cost per graduate as a unit of analysis as well as GAO's treatment of the University's cost-avoidance activities and contributions to the training and education of physicians for the unique demands of military medicine. GAO believes that its findings are presented in a balanced and objective way. These issues are discussed in more detail on page 60. As a result of these comments and technical suggestions, GAO has revised the report as appropriate.

Contents

Executive Summary		2
Chapter 1 Introduction		16
	Current Physician Accession Programs	16
	The Special Needs of Military Medicine	19
	Objectives, Scope, and Methodology	21
Chapter 2 Analysis of University and Scholarship Program Costs		23
	Key Factors Considered in Our Analysis	23
	Results of Our Analysis	27
	Career Compensation Is Higher for University Graduates Than for Scholarship Participants	30
	Non-DOD Federal Dollars for Medical Education and GME Increase Overall Costs	31
Chapter 3 The University Provides Medical Education Comparable to Civilian Schools and Emphasizes the Special Needs of Military Medicine		34
	Quality of Medical Education at the University Compares Favorably With That Provided by Other Sources	34
	University Students Receive Extensive Medical Readiness Training, but Its Impact Is Unclear	40
Chapter 4 Other Activities of the University		47
	Education and Training Activities	47
	Research, Consultation, and Archival Activities	49
Chapter 5 DOD's Retention Needs Are Unknown		51
	University and Scholarship Program Retention Patterns	51
	DOD Is Evaluating Its Overall Need for Physicians	53
	Factors Influencing Physician Retention	55

Chapter 6 Conclusions

59
Matter for Congressional Consideration 60
Agency Comments 60

Appendixes

Appendix I: Objectives, Scope, and Methodology 64
Appendix II: Comparison of Hours Spent in Initial Medical Readiness Training 73
Appendix III: Studies of Factors Affecting Retention of Military Physicians 75
Appendix IV: Responses of the Uniformed Services University of the Health Sciences to the Inspector General's Recommendations 78

Tables

Table 1.1: Physician Accessions by Source 17
Table 2.1: Expected Years of Service From Each Accession Source 25
Table 2.2: Educational Costs for University and Scholarship Graduates 29
Table 2.3: Projected Costs of GME for University and Scholarship Graduates 29
Table 2.4: Costs of Military Training for University and Scholarship Graduates 30
Table 2.5: Costs of Salary and Bonuses for University and Scholarship Graduates 30
Table 2.6: Retirement Benefits for University and Scholarship Graduates 31
Table 2.7: DOD Costs for Education and Career Compensation of University and Scholarship Graduates 31
Table 2.8: Federal Support Allocable to University and Scholarship Graduates 32
Table 2.9: Total Federal Costs for Education and Career Compensation of University and Scholarship Graduates 33
Table 3.1: Results of USMLE Taken by the University's 1993 Graduating Class 38
Table 3.2: Results of USMLE Taken by the University's 1994 and 1995 Graduating Classes 38
Table 3.3: Intern Evaluations for 1994 39
Table 4.1: Number of Graduate Nursing Students Entering in Fiscal Years 1993-96 49
Table 5.1: Active Duty Physician Requirements as Portrayed in the 733 Study 53

Table I.1: Yearly Tracking of Cohort Group Members at the University 65
Table I.2: Yearly Tracking of Size of Cohort Group, Navy Scholarship Program 66
Table II.1: Comparison of Hours Spent in Initial Medical Readiness Training 74

Figures

Figure 1: Per Graduate Costs for University and Scholarship Program Participants 6
Figure 2: Per Expected Year Costs of Service for University and Scholarship Program Participants 8
Figure 3.1: MCAT Scores for University and Other Students Entering Medical School in 1994 36
Figure 3.2: Undergraduate GPAs for University and Other Students Entering Medical School in 1994 37
Figure 3.3: Comparison of Initial Readiness Training by Training Source 42

Abbreviations

AAMC	Association of American Medical Colleges
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services
C4	Combat Casualty Care Course
DOD	Department of Defense
CBO	Congressional Budget Office
EEO	equal employment opportunity
GME	graduate medical education
GPA	grade point average
HEHS	Health, Education, and Human Services Division
HPSP	Health Profession Scholarship Program
IG	inspector general
LCME	Liaison Committee on Medical Education
MCAT	Medical College Admissions Test
NIH	National Institutes of Health
NPR	National Performance Review
NSIAD	National Security and International Affairs Division
OMB	Office of Management and Budget
OSD	Office of the Secretary of Defense
PA&E	Program Analysis and Evaluation
ROTC	Reserve Officer Training Corps
USMLE	United States Medical Licensing Examination
USU	Uniformed Services University of the Health Sciences

Introduction

The Department of Defense (DOD) has about 13,700 active duty physicians, nearly 1,300 of whom entered military service in fiscal year 1994.[3] About 93 percent of these new physicians entered the military through the Health Profession Scholarship Program (HPSP) or through DOD's medical school—the Uniformed Services University of the Health Sciences (USU)—which were authorized as complementary programs under the Uniformed Services Health Profession Revitalization Act of 1972 (P.L. 92-426.)

To acquire physicians through these two programs, DOD incurs either the costs of providing the participants a medical education plus student stipends for scholarship participants or military salaries and benefits for students at the University. After the participants graduate from medical school, DOD incurs the costs of physician ownership—providing graduate medical education (GME)[4] and other training; salaries, bonuses, and benefits; and retirement pay for those physicians who remain on active duty for at least 20 years.

Military physicians are needed to support operational forces during war or other military operations and to maintain the well-being of the forces during nonoperational periods. Military physicians also provide health care services to nonactive duty beneficiaries.

Current Physician Accession Programs

With the end of the draft in 1972, the military services needed new means of obtaining active duty physicians. To address this need, Public Law 92-426 established two complementary accession sources—the scholarship program and the University. In addition to these sources, the services continue to attract physicians directly from the private sector.[5] Table 1.1 shows the number of physicians entering each military service from each accession program for fiscal years 1992 to 1994.

[3]The services also have about 6,500 physicians in the reserves. However, except where indicated, this report addresses issues related to active duty physician accession programs (the University and the scholarship program).

[4]During their fourth year of medical school, students formally elect the medical specialty area they intend to pursue. The medical specialty training programs, which generally take 3 to 7 years to complete, are referred to as graduate medical education (GME). During this time, physicians are generally referred to as interns or residents.

[5]In 1994, about 7 percent of physicians came through programs such as the Financial Assistance Program, which pays incentives to medical school graduates specializing in medical disciplines critical for wartime needs, and through direct recruitment of civilian physicians. Because of the small numbers involved, they were not included in the analyses for this report.

Table 1.1: Physician Accessions by Source (Fiscal Years 1992-94)

	1992				1993				1994			
Source	**Army**	**Navy**	**Air Force**	**Total**	**Army**	**Navy**	**Air Force**	**Total**	**Army**	**Navy**	**Air Force**	**Total**
HPSP[a]	351	363	380	1,094	313	373	306	992	313	344	393	1,050
USU[b]	69	56	47	172	56	46	48	150	56	48	43	147
Other	49	53	182	284	46	32	102	180	22	45	21	88
Total	**469**	**472**	**609**	**1,550**	**415**	**451**	**456**	**1,322**	**391**	**437**	**457**	**1,285**

[a]Scholarship accessions include current-year graduates and graduates from previous years who deferred their active-duty service to participate in civilian GME programs.

[b]Some students take longer than 4 years to complete medical school, while others drop out for various reasons; hence, the total number of graduates differs from the average number of students enrolled in each class (about 160). In addition, during this same period, 19 University graduates entered the Public Health Service: 6 in 1992, 5 in 1993, and 8 in 1994.

Health Profession Scholarship Program

The scholarship program is the largest source for military physicians.[6] The legislative history of Public Law 92-426 indicates that the scholarship program was intended to provide the services with the majority of their physicians, most of whom would not be expected to make the military a lifetime career. Under the scholarship program, the services pay medical school tuition and fees as well as stipends for civilian medical school students. In return, after graduation, program participants must serve 1 year of active duty military service for each year that they receive benefits with a 2-year minimum obligation. Scholarship program participants also incur an obligation to serve in the reserves for a period of time, which varies depending upon the number of years of benefits received. The total obligation of active and reserve duty is 8 years for all scholarship program participants (not including time spent in GME).

Upon graduation, most scholarship program participants enter active duty at the O-3 pay grade (that is, as captains in the Army and Air Force and as lieutenants in the Navy) and begin their first year of GME in military medical facilities. Licensure typically occurs at the end of that year. At that point, depending upon the needs of the service, a scholarship program participant may continue GME or begin serving as a general medical officer. Time spent in GME does not satisfy the commitment incurred as a participant in the scholarship program; however, such time is credited for retirement purposes.

[6]The scholarship program also sponsors students of dentistry, optometry, and nursing.

Although most scholarship program participants enter active duty upon graduation from medical school, others are granted a deferment so that they may pursue GME in the civilian sector. Upon completion of their GME, deferred scholarship program participants serve their active duty obligations, entering active service at the pay grade they would have attained had they not deferred their military service. Of the 987 scholarship program participants who graduated in fiscal year 1994, 283 were deferred. Scholarship program participants who participate in military GME programs are referred to as regular scholarship program participants. In fiscal year 1994, 704 regular scholarship program participants entered the military.

For DOD, the educational costs of acquiring physicians through the scholarship program include medical school tuition and fees, student stipends, active duty pay for a 45-day period each year, and program administration costs. After graduation, the costs that DOD incurs to employ these physicians include those for GME (for those graduates who participate in military GME programs); initial medical readiness training (including basic officer training); salary, bonuses, and benefits; and retirement pay for those physicians who remain on active duty for at least 20 years.

Uniformed Services University of the Health Sciences

The University also authorized by Public Law 92-426, is DOD's medical school in Bethesda, Maryland. According to the legislative history, the University is intended to provide DOD a group of military physicians likely to make the military a career.

When students enter the University's School of Medicine, they begin active military service with the pay grade of O-1 (that is, as second lieutenants in the Army and Air Force or ensigns in the Navy) and receive all benefits associated with active military service. Upon graduation, University students are promoted to the grade of O-3 and begin serving a 7-year obligation. They might also incur a reserve obligation of 2 to 6 years (not including time spent in GME).

On average, the University has enrolled about 160 students each year since 1981. Most graduates go into the Army, Navy, or Air Force; however, a limited number of students each year are sponsored by the Public Health Service. For example, of the 155 graduates in 1994, 8 were sponsored by the Public Health Service. Since its first class graduated in 1980, the

University has produced 2,064 physicians for the three services and 84 for the Public Health Service.

For DOD, the educational costs of acquiring physicians through the University include the costs of student and faculty salaries and benefits, facility operations and maintenance, and basic officer training. After students graduate, DOD incurs the costs of their GME, salary and benefits, and retirement pay for those who serve at least 20 years.

The Special Needs of Military Medicine

Military medicine is not a recognized medical specialty; however, medical literature we reviewed as well as military and civilian officials with whom we spoke identified a number of factors that differentiate the practice of military medicine from the practice of medicine in civilian settings. According to these sources, the primary factors that contribute to the special needs of military medicine are the objectives of the combat medical care system, the circumstances and environments in which care is provided, and the need to understand military operations and procedures. However, no consensus exists in DOD or the services regarding the amount or types of education and training physicians need—in addition to traditional medical education—to meet the special needs of military medicine. Chapter 3 discusses how University and scholarship program graduates are prepared for the special needs of military medicine.

Military Medicine Emphasizes Keeping Troops Fit for Duty

Practitioners of military medicine concentrate their attention on preventing and treating illnesses and injuries more commonly experienced in operational or combat settings. While similar or related illnesses, injuries, or health concerns exist in civilian settings, military medical literature and practitioners state that some illnesses and injuries lack parallels in civilian settings; thus special training is necessary to practice medicine in operational settings in support of combat and noncombat missions.[7]

Military medical literature notes that the objectives of the combat medical care system are different from civilian objectives. In civilian circumstances, the physician's objective is to ensure the welfare of the individual patient. In contrast, the objective of the military physician is to "conserve the fighting strength" in order to ensure the success of the

[7]For further discussion about military medicine see International Military and Defense Encyclopedia (Washington, D.C.: Brassey's, Inc., 1993); Public Health & Preventive Medicine 13th ed. (East Norwalk, Conn: Appleton & Lange, 1992); and The Oxford Companion to Medicine, (Oxford: Oxford University Press, 1986).

military mission. To minimize troop losses to disease and injury both before and during deployment, the military physician is responsible for identifying the health threats to which troops are exposed and developing plans to minimize their impact. Such preventive medicine programs include immunization, sanitation, and safety awareness.

The Provision of Care in Combat Settings

When troops become ill or are injured in combat, the objective of military physicians is to provide treatment that will permit the patient's return to duty, if possible, or removal of the patient to a location where additional care may be provided. To accomplish this objective, the combat medical system is organized into echelons, or different levels of medical support for combat troops. Echelon 1, the most far-forward and mobile level of medical support, is necessarily the most austerely staffed and equipped. At this level, minimally injured personnel are treated and returned to combat. More serious casualties are evacuated to higher echelons. Each echelon, 2 through 5, has all the capabilities of the lower echelons, plus increasingly sophisticated capabilities.

An essential element of the combat medical system is the practice of triage, or sorting, which is based on the principle of accomplishing the greatest good for the greatest number under the circumstances. Triage is the process of establishing the priorities for treatment and evacuation and is necessary in the case of mass casualties in order to avoid overwhelming the medical resources available. In such instances, before providing treatment, medical personnel are required to place casualties in categories ranging from urgent (those injuries requiring immediate intervention to prevent death) to expectant (wounds so severe that survival would be unlikely even if all medical resources were applied.)

Medical Staff Advise Line Commanders

In operational settings, the military physician serves as medical staff advisor to the commander. In so doing, the physician participates in the development of command plans and policies, advises the commander on relevant medical issues, and works with other staff officers to ensure medical support of military operations. Given these responsibilities, military physicians need an understanding of military operations, staff planning and administration processes, the various work environments, and the natural and manmade hazards that personnel may encounter.

Objectives, Scope, and Methodology

Even before its first class enrolled in 1976, the University was controversial. Several earlier studies have concluded that the University is the most costly source of obtaining military physicians. Consequently, proposals have been made to close the University, including one that resulted from the work of the National Performance Review (NPR).[8]

The National Defense Authorization Act for Fiscal Year 1995 specifically prohibited the closure of the University and directed us to report on issues related to the University and other sources of military physicians. The act directed us to report on various aspects of physician accession programs including costs, retention rate patterns, quality of medical education, and preparation for the special needs of military medicine. The act also directed us to report on actions taken by the University in response to recommendations made in 1990 by DOD's Inspector General concerning internal controls and other issues.

To respond to these issues, we collected information (through interviews and documentation) from the following organizations and officials:

- the Office of the Assistant Secretary of Defense (Health Affairs);
- the Uniformed Services University of the Health Sciences;
- the Joint Staff;
- the Offices of the Surgeons General of the Army, Navy, and Air Force;
- medical readiness training representatives for each service;
- major medical units throughout DOD;
- the Office of Management and Budget;
- NPR;
- the Congressional Budget Office;
- the American Medical Association;
- the Association of American Medical Colleges; and
- various other organizations within and outside of DOD.

A detailed discussion of our methodology is presented in appendix I.

The results of our cost analysis are presented in chapter 2. Chapter 3 discusses the quality of medical education obtained by military physicians and how physicians from each accession source are prepared to meet the special needs of military medicine. Chapter 4 provides information on the activities conducted at the University in addition to its School of Medicine. Chapter 5 provides information on issues related to the retention of

[8]NPR, led by Vice President Gore, was an Administration effort to identify opportunities to streamline government operations. In September 1993, NPR recommended closing the University.

physicians. Chapter 6 presents overall conclusions about military physician accession programs and related issues. Appendix IV discusses the responses to the 1990 recommendations of DOD's Inspector General.

Our work was conducted between September 1994 and August 1995 in accordance with generally accepted government auditing standards.

Analysis of University and Scholarship Program Costs

Our review of the costs of obtaining and retaining physicians for the military focused on the historical educational costs for the graduating class of 1994 and the projected postgraduation costs for additional training (including GME and initial medical readiness training), salary, and retirement costs. We analyzed prior studies and held discussions with military and civilian officials to identify the factors to include in our analysis. Our analysis showed that when considering DOD costs, the University is the most expensive source of military physicians. In a supplemental analysis, which includes an estimate of additional federal support for medical education, the University is the most expensive on a per graduate basis but comparable in cost to other accession sources when physician costs are distributed over the expected lengths of their military careers.

Key Factors Considered in Our Analysis

In developing our analysis of University and scholarship program costs, we made decisions regarding the following key factors:

- the appropriate year to use as the base year for analytical purposes,
- the appropriate units of analysis against which to compare the estimated costs for each program,
- the use of retention rate data in the cost equations, and
- the appropriate methods of treating various components of each program's costs.

Each factor is discussed below with particular reference to the differences in approaches used by the Office of the Assistant Secretary of Defense, Program Analysis and Evaluation (PA&E), and the University[9] in their analyses of the costs of obtaining physicians for the military. The University's study, which responds to the issues that we were asked to address in the National Defense Authorization Act for Fiscal Year 1995, concluded that the scholarship program (as a combined program) is almost 2 times more costly than the University. The DOD study concluded that the University was 20 to 27 percent more costly than the regular scholarship program and 39 to 63 percent more costly than the deferred scholarship program, depending on medical specialty.

Base Year for Analysis

Our review focused on the historical educational costs for the graduating class of 1994 and the projected costs for additional training and career

[9]The University "Working Copy" for the Senate Armed Services Committee Directed USUHS Review, March 1995, Physician Retention and the Cost-Effectiveness of the Uniformed Services University of the Health Sciences, DOD/Office of the Assistant Secretary of Defense (PA&E), July 1991.

compensation as expressed in 1994 constant dollars. Our focus on a specific graduating class represents a snapshot of the cost factors as they existed at the time of our analysis and can provide a benchmark for later analyses. The University's analysis is also based on the 1994 graduating class; however, the PA&E analysis was performed in 1991 using 1989 data.

Unit of Analysis

PA&E used the number of expected years of service for the graduates of each program as the measure of benefit and the estimated cost per expected year of service as its unit of analysis. The University used the number of years of obligation for the graduates of each program as the measure of benefit and the cost per year of obligation as its unit of analysis.[10]

We used the PA&E unit of measurement and analysis (expected years of service)[11] and the costs per graduate from each program as an interim unit of analysis. We believe that the University's focus on the minimum obligation period understates each program's contribution to military medicine because some graduates from all accession programs are retained longer than the minimum obligation period, including some who stay to retirement.

For example, under the University model, the 155 graduates from its class of 1994 are expected to provide 1,085 staff years of service based on a 7-year obligation. For the scholarship program, the University model uses a 4-year obligation, which results in 2,816 expected staff years of service for the regular scholarship program and 1,132 for the deferred scholarship program.

Table 2.1 shows our calculation of expected years of service for 1994 graduates of the University and the scholarship program using DOD physician retention projections.

[10]The scholarship program obligation of 4 years is an estimate based upon experience, whereas the University obligation of 7 years is supported by the statute.

[11]The University developed this measure in 1975 because it expected its environment would cause a larger percentage of its graduates to choose the military as a career.

Table 2.1: Expected Years of Service From Each Accession Source

Accession source	Graduates in 1994	Expected years of service per graduate	Expected years of service from 1994 graduates
USU	155	18.45	2,860
HPSP (regular)	704	9.75	6,865
HPSP (deferred)	283	5.29	1,497

Retention Rates

The selection of the expected years of service as our unit of analysis required that we use physician retention data in our calculations. Since 1981, DOD has maintained an electronic database on the rates at which physicians leave or stay in the military. The retention database identifies the program through which physicians are obtained, the military department, and the percentage of physicians remaining each year. DOD makes projections about (1) the average years of service that may be anticipated from physicians and (2) the percentage of physicians expected to stay in the military to retirement from each accession source. DOD's projections are based on historical retention data for each program and the experience of all military physicians.

DOD officials acknowledged that their retention database has not been updated since 1993. However, DOD and service officials agreed that DOD's projections using this database are the best DOD-wide information available on the retention of military physicians. We used DOD's retention projections to calculate the expected staff years of service for each accession source by multiplying the actual number of graduates from each program by the expected years of service for graduates from each program. We also calculated projected career compensation (salary and bonuses) and retirement costs using the DOD physician retention data.

Treatment of Program Costs and Uncertainties

PA&E examined the costs of procuring and retaining physicians from medical school through retirement. PA&E's cost elements included the University's budget, educational costs for the scholarship program, military GME costs, salary and bonuses during a physician's career, and estimates of physician retirement benefits. The University's methodology focused on its operational budget and scholarship program educational costs, but excluded the other DOD costs associated with training and retaining physicians used in the PA&E model.

We used the PA&E cost elements when considering DOD's costs. DOD incurs costs for military physicians after they graduate from medical school—including the University—because of medical and military training requirements and to pay salaries and benefits during the military physician's career. Under our calculation, educational costs represent about 9 percent of DOD's total costs for the regular scholarship program, about 17 percent for the University, and about 19 percent for the deferred scholarship program.

Treatment of Some University Costs

The total University budget in any year includes funding for activities that do not directly contribute to the education of a medical student. For example, in fiscal year 1994, the University budget included $28.5 million for projects, such as research on head and neck injuries, and the Armed Forces Radiobiological Research Institute. DOD and University officials agreed that these costs should not be included because they are not associated with the education of physicians. However, the University excluded an additional $18.6 million from its analysis for cost-avoidance activities. These are largely faculty and staff activities that the University believes DOD would continue to procure even if the University is closed, but at potentially higher costs.

We have not included the University's reductions for cost avoidance because our methodology focused on the actual outlays for the educational costs of the University and the scholarship program. Moreover, we were unable to validate the details in the University's cost avoidance estimates.

Additional Federal Dollars to Civilian Medical Education

The University included additional federal contributions to civilian medical education (and by extension to the scholarship program) in its analysis, while the PA&E study did not. Considerable debate exists about whether other (non-DOD) federal support for medical education should be considered in the cost of obtaining military physicians. Authors of previous cost studies have argued that inclusion of these funds is inappropriate because this funding is made to civilian schools for reasons totally unrelated to the scholarship program. Counterarguments suggest that other federal support should be attributed to the scholarship program because civilian medical schools require this federal support to continue their operations.

If other federal expenditures for the education of scholarship program students are included in the analysis, only a portion of these costs should be viewed as related to their careers as military physicians. For example, deferred scholarship program graduates serve about 5.29 years in the military on average and many more in the private sector. Nonetheless, because of the interest in some quarters for inclusion of other federal costs, we developed a supplemental analysis including, as a subsidy to the scholarship program, Department of Health and Human Services funding to civilian medical schools for research and GME programs (commensurate with the rate of scholarship program participation in civilian undergraduate and graduate medical education programs).

In an effort to ensure comparability between the cost elements in the programs, we also included other federal dollars to the University in the form of research grants and support for its graduates who participated in civilian GME programs.

Additional details about our cost methodology are in appendix I.

Results of Our Analysis

Our analysis of DOD's costs to educate and retain a military physician showed that the University is more costly than the scholarship program on a per graduate and an expected year of service basis. To illustrate:

- DOD's educational costs per graduate were $566,506 for the University and $125,946 for the scholarship program;[12]
- DOD's educational costs per expected year of service were $30,697 for the University, $12,916 for the regular scholarship program, and $23,825 for the deferred scholarship program;
- DOD's total per graduate costs were $3.3 million for the University, $1.5 million for the regular scholarship program, and $0.7 million for the deferred scholarship program; and
- DOD's total costs per expected year of service were $176,236 for the University, $149,969 for the regular scholarship program, and $124,801 for the deferred scholarship program.

Our supplemental analysis showed that when an estimate of additional federal dollars that support civilian medical education is included in the analysis, the University is more costly on a per graduate basis, but on an expected year of service basis, the University is nearly equal the cost of

[12]Educational costs are the same on a per graduate basis for the deferred and regular scholarship programs.

the regular scholarship program and less costly than the deferred scholarship program. To illustrate:

- the total cost per graduate, when all federal costs are included, was $3.4 million for the University, $1.8 million for the regular scholarship program, and $1.2 million for the deferred scholarship program; and
- the total cost per expected year of service, when all federal costs are included, was $181,575 for the University, $181,169 for the regular scholarship program, and $231,501 for the deferred scholarship program.

DOD Educational Costs Are Higher for the University Than for the Scholarship Program

The medical educational costs associated with the University include facility operations and maintenance, research and development, procurement, construction, and military and PHS salaries for faculty and students. Educational costs associated with the scholarship program include medical school tuition and fees, stipends and salaries for students, summer training, and program administration.

The DOD cost to educate the 1994 graduates of the University was $566,506 per graduate—4-1/2 times as great as the cost to educate a medical student through the scholarship program ($125,946).

University Costs Are Amortized Over a Longer Period of Time

The difference in cost between the University and the scholarship program narrows when education costs are amortized over the expected length of service for each group. DOD estimates show that physicians from the University are expected to serve nearly twice as long as their regular scholarship program peers and more than three times as long as deferred scholarship program physicians. Using DOD estimates that, on average, physicians from the University will serve 18.45 years; regular scholarship program physicians 9.75 years; and deferred scholarship program physicians 5.29 years, our calculation of the educational cost per expected year of service for University graduates was $30,697. Costs per expected year of service for University graduates are more than twice those for regular scholarship program participants ($12,916) who begin active military service immediately after graduation and 29 percent higher than the per expected year of service cost for scholarship program participants ($23,825) who defer their military service to attend GME in civilian institutions. Table 2.2 compares DOD's educational costs for University and scholarship program physicians who graduated in 1994 on a per graduate and per expected year of service basis.

Table 2.2: Educational Costs for University and Scholarship Graduates

	USU	HPSP (regular)	HPSP (deferred)
Per graduate	$566,506	$125,946	$125,946
Per year of service	30,697	12,916	23,825

GME and Medical Readiness Training

Regular scholarship program participants and most University graduates receive additional medical training through GME programs primarily in DOD's medical treatment facilities. DOD's most current study of its military GME costs (based on 1992 data) estimated the annual GME cost per participant at $168,777, including resident salaries.[13] Assuming an average of 4 years of GME for each participant, the GME per participant cost is $521,048, after adjusting for inflation. (Military GME costs do not apply to deferred scholarship program or University graduates who participate in civilian GME programs.) While the GME costs on a per participant basis are identical for the University and the regular scholarship program, the per graduate costs differ because the University costs are spread over all its graduates (155), even though 6 University graduates participate in civilian GME programs. GME costs for those 6 University graduates and all deferred scholarship participants are included in "non-DOD federal dollars", as discussed on page 31. Table 2.3 shows our projections of DOD's GME costs for University and regular scholarship program physicians who graduated in 1994.

Table 2.3: Projected Costs of GME for University and Scholarship Graduates

	USU	HPSP (regular)
Per graduate	$500,879	$521,048
Per year of service	27,141	53,433

In addition to their graduate medical education, military physicians are required to have basic officer training, regardless of their accession source. In general, new scholarship program physicians also attend the Combat Casualty Care Course to acquire basic field medical skills. (University graduates generally do not attend the Combat Casualty Care Course.) Our projected costs (based on DOD estimates) of these training courses for the physicians who graduated in 1994 are shown in table 2.4.

[13]Cost Analysis of the Military Medical Care System Institute for Defense Analysis, September 1994.

Table 2.4: Costs of Military Training for University and Scholarship Graduates

	USU	HPSP (regular)	HPSP (deferred)
Per graduate	$5,776	$10,970	$10,970
Per year of service	313	1,125	2,075

Career Compensation Is Higher for University Graduates Than for Scholarship Participants

In addition to the cost of medical education, DOD bears physician retention costs, including career salary and bonuses, as well as retirement benefits. Compensation costs are estimated to be highest for graduates of the University because, on average, they are expected to remain in the service longer and to earn retirement benefits at a rate higher than either their deferred or regular scholarship program peers.

Salary and Bonuses Are Highest for University Graduates

Active duty compensation for physicians includes regular pay and allowances as well as special pay and bonuses that vary depending upon board certification status, length of service, and other factors. Because University graduates will be compensated over a greater number of years than their scholarship program peers, the per graduate compensation costs are estimated to be the highest for University graduates. Deferred scholarship program graduates earn nearly as much on an expected year of service basis because they enter active duty service after becoming fully trained in a medical specialty and, thus, receive higher compensation for the fewer years they serve. University and regular scholarship program graduates receive lower salaries while in military GME programs than they earn after their GME training, which reduces their average career earnings on an expected year of service basis. Table 2.5 shows the estimated costs of salary and bonuses for the University and scholarship program physicians who graduated in 1994.

Table 2.5: Costs of Salary and Bonuses for University and Scholarship Graduates

	USU	HPSP (regular)	HPSP (deferred)
Per graduate	$1,739,626	$723,257	$497,302
Per year of service	94,265	74,169	94,075

Retirement Costs Are Higher for University Graduates Than for Scholarship Participants

Military physicians are eligible for retirement benefits after 20 years of active military service. Because the University graduated its first class only 15 years ago, actual retirement data are not available. However, based on experience with other military physicians, DOD estimates that about

50 percent of the 1994 University graduates will remain on active duty through retirement, compared with 3 percent for deferred scholarship program graduates and 11 percent for regular graduates. Because the expected retirement rate for University graduates is higher than their scholarship program peers, projected retirement costs for physicians who graduated in 1994 are correspondingly higher for the University, as shown in table 2.6.

Table 2.6: Retirement Benefits for University and Scholarship Graduates[a]

	USU	HPSP (regular)	HPSP (deferred)
Per graduate	$439,575	$81,186	25,506
Per year of service	23,819	8,326	4,825

[a]Retirement benefits do not include DOD contributions to Social Security or other retirement plans.

Table 2.7 summarizes DOD costs for educating and retaining military physicians.

Table 2.7: DOD Costs for Education and Career Compensation of University and Scholarship Graduates

	Costs per graduate			Costs per year of service		
Cost element	USU	HPSP (regular)	HPSP (deferred)	USU	HPSP (regular)	HPSP (deferred)
Education	$566,506	$125,946	$125,946	$30,697	$12,916	$23,825
Pay	1,739,626	723,257	497,302	94,265	74,169	94,075
Retirement	439,575	81,186	25,506	23,819	8,326	4,825
GME	500,879	521,048	[a]	27,141	53,433	[a]
Military training	5,776	10,970	10,970	313	1,125	2,075
Total DOD costs[b]	**$3,252,362**	**$1,462,408**	**$659,724**	**$176,236**	**$149,969**	**$124,801**

[a]Not applicable; deferred scholarship students do not participate in military GME programs.

[b]Totals may not add due to rounding.

Non-DOD Federal Dollars for Medical Education and GME Increase Overall Costs

Beyond the costs to DOD, a portion of the federal dollars that support undergraduate and graduate medical education may be considered as part of the overall cost of educating military physicians. For example, one form of federal support for undergraduate medical education is research funding through the National Institutes of Health ($5.7 billion in 1994) and

other federal agencies. Similarly, a portion of the federal dollars that support civilian GME through the Medicare program ($6.2 billion in 1994) may be considered relevant to the overall cost of educating physicians from the deferred scholarship program and the University (six Public Health Service graduates from the University's class of 1994 are participating in civilian GME programs). Table 2.8 shows our estimate of these costs.

Table 2.8: Federal Support Allocable to University and Scholarship Graduates

	USU	HPSP (regular)	HPSP (deferred)
Per graduate	$98,522	$304,248	$564,038[a]
Per year of service	5,339	31,200	106,700

[a]The deferred scholarship program includes federal support for undergraduate ($304,248) and graduate medical education ($259,790).

When all federal costs are included on a per graduate basis, our analysis shows that at a cost of $3.4 million, the University is about 1.9 times more expensive than the regular scholarship program ($1.8 million) and more than 2.7 times more expensive than the deferred scholarship program ($1.2 million). However, when total federal costs are spread over the expected life of a physician's military career, the University is more comparable in cost to the other accession sources at $181,575 per expected year of service. The deferred scholarship program is the most expensive source using this approach at $231,501, while total federal costs for the regular scholarship program total $181,169 on an expected years of service basis. Table 2.9 summarizes total federal costs for obtaining and retaining military physicians.

Table 2.9: Total Federal Costs for Education and Career Compensation of University and Scholarship Graduates

	Costs per graduate			Costs per year of service		
	USU	HPSP (regular)	HPSP (deferred)	USU	HPSP (regular)	HPSP (deferred)
Education	$566,506	$125,946	$125,946	$30,697	$12,916	$23,825
Pay	1,739,626	723,257	497,302	94,265	74,169	94,075
Retirement	439,575	81,186	25,506	23,819	8,326	4,825
GME	500,879	521,048	[a]	27,141	53,433	[a]
Military training	5,776	10,970	10,970	313	1,125	2,075
Total DOD costs[b]	$3,252,362	$1,462,408	$659,724	$176,236	$149,969	$124,801
Other federal support	$98,522	$304,248	$564,038[c]	$5,339	$31,200	$106,700
Total federal costs[b]	$3,350,883	$1,766,656	$1,223,762	$181,575	$181,169	$231,501

[a]Not applicable. GME costs for deferred scholarship program participants are included in other federal support.

[b]Totals may not add due to rounding.

[c]The deferred scholarship program includes federal support for undergraduate ($304,248) and graduate medical education ($259,790).

The University Provides Medical Education Comparable to Civilian Schools and Emphasizes the Special Needs of Military Medicine

Our analysis shows that the University's School of Medicine provides a traditional medical education that compares well with other U.S. medical schools and combines that education with coverage of topics more specifically related to the practice of military medicine. Traditional measures of quality place the University's program within the midrange of medical schools nationwide and its graduates at or above other military physicians. The commanders of military medical treatment facilities that we contacted regard physicians who are graduates of the University as at least as well-prepared as their civilian-educated colleagues for the practice of medicine in the clinical setting. Our analysis shows that the University also provides students more exposure to the special needs of military medicine. Also, the medical commanders believe that the University's approach produces physicians who at least initially are better prepared than their civilian-educated peers to meet the demands of military medicine. However, no conclusive evidence exists to show that University graduates are better prepared to meet DOD's operational needs.

Quality of Medical Education at the University Compares Favorably With That Provided by Other Sources

Indicators generally accepted in the medical community show that the University provides the military services with physicians whose medical education is equivalent in quality to the education received by other military physicians. The University's School of Medicine is fully accredited and its students have undergraduate grade point averages and admission test scores that fall within the midranges for such statistics for all medical schools. Postgraduate measures such as pass rates for the medical license examination and graduates' performance in their first year of GME indicate that University graduates are equivalent to or slightly better than other military physicians.

The University Has Earned Full Accreditation

Most medical schools in the United States are accredited by the Liaison Committee on Medical Education (LCME), a joint activity of the Association of American Medical Colleges (AAMC) and the Council on Medical Education of the American Medical Association.[14] In April 1993, LCME awarded the University full accreditation for 7 years, the standard length of time. LCME also identified areas for improvement during the

[14]LCME accredits the University's School of Medicine and the other 125 allopathic medical schools in the United States. U.S. schools of osteopathic medicine are accredited by the American Osteopathic Association.

accreditation process, including an overly dense curriculum[15] (particularly for students' first 2 years) and vacancies in several department chairs.

In February, 1995, LCME notified the University of its satisfaction with the University's progress in making improvements in these areas. For example, in response to the concerns raised about the density of its curriculum, modifications were made to the curriculum of the basic sciences to allow an afternoon of self-study in most weeks for first and second year students. In addition, four of the five vacant faculty chairs were filled. However, in June 1995, the position of the Dean of the School of Medicine became vacant and, as of September 1995, the School was seeking a permanent Dean.

In addition to LCME's accreditation of the School of Medicine, the University, as a whole, has been accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, an organization that accredits institutions of higher learning.

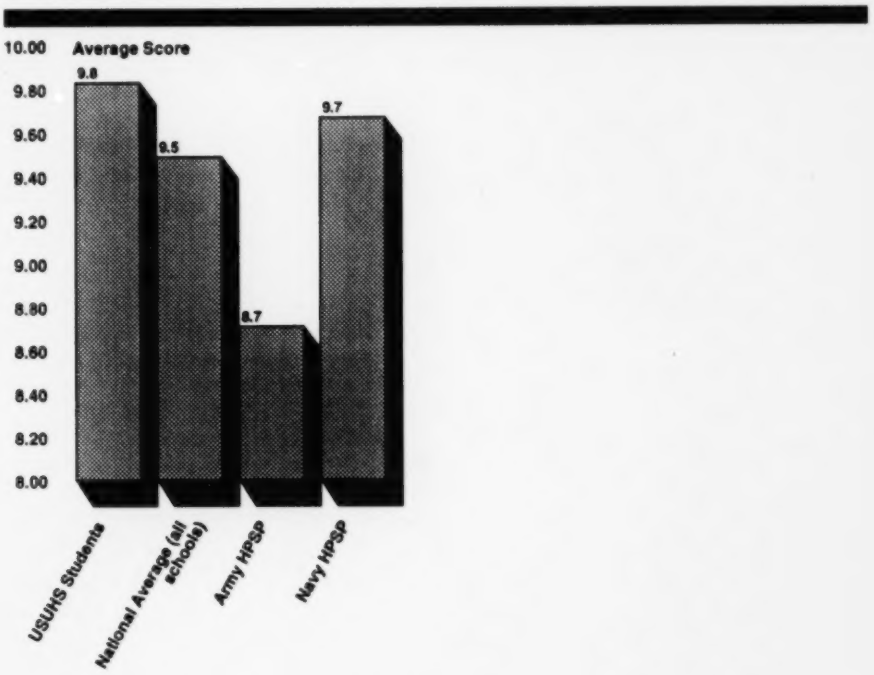
Characteristics of Students Entering the University

In the medical community, the academic credentials of the students that a medical school attracts are considered to be a reflection of the school's quality. Two widely used measures of academic achievement among medical school applicants are undergraduate grade point averages (GPA) and scores on the Medical College Admissions Test (MCAT).

Compared with their peers nationwide, students who entered the University in the fall of 1994 had above average MCAT scores. In addition, the MCAT scores of students at the University were higher than those for the Army and Navy scholarship program participants who entered in 1994. Figure 3.1 shows these averages.

[15]A curriculum that includes a very high percentage of classroom instruction, leaving little time for independent study.

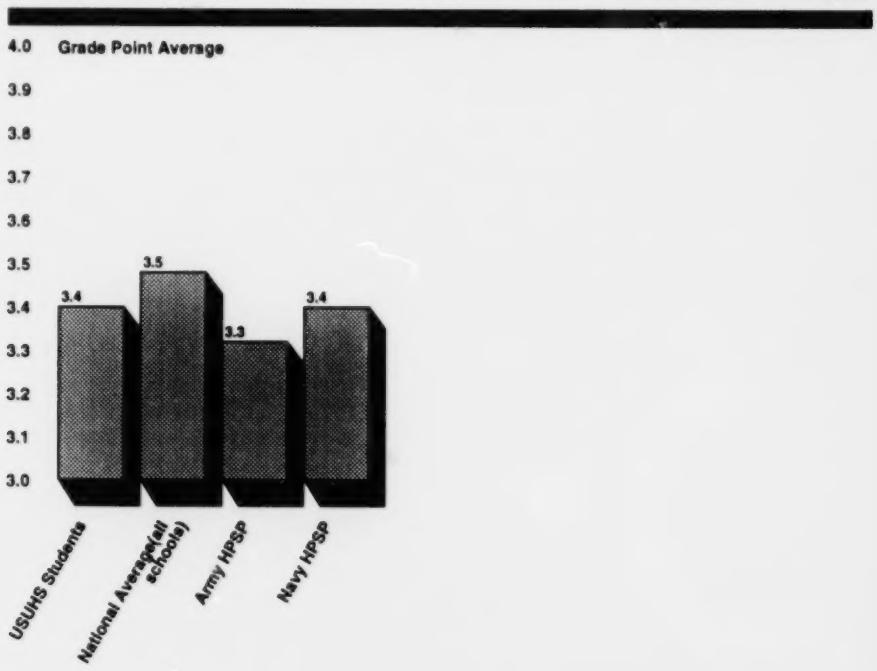
Figure 3.1: MCAT Scores for University and Other Students Entering Medical School in 1994



Note: GPA is computed on a 4-point scale. The Air Force was not able to provide similar data.

In contrast, Figure 3.2 shows that University students had average undergraduate GPAs that were slightly below the national average, higher than Army scholarship program entrants, and equivalent to Navy scholarship program entrants.

Figure 3.2: Undergraduate GPAs for University and Other Students Entering Medical School in 1994



Note: MCAT is graded on a 15-point scale. The Air Force was not able to provide similar data.

Achievements of University Graduates

University graduates compare favorably with other medical school graduates in their performance on the United States Medical Licensing Examination (USMLE) and in their evaluations from internships at military medical treatment facilities. Military medical commanders believe that University graduates perform as well or better clinically than other military physicians. DOD data indicate that University graduates are cited for fewer adverse clinical privileging actions than other military physicians.

University Students Perform Well on USMLE

All students seeking medical licensure take the three steps of the USMLE, administered by the National Board of Medical Examiners. Part 1 tests the student's ability to apply knowledge of the basic biomedical sciences, part 2 assesses the student's application of clinical capabilities under supervision, and part 3 measures the candidate's use of medical knowledge deemed appropriate for the unsupervised practice of general

medicine. The most recent University class to have completed all three parts of the USMLE is the class that graduated in 1993. Those students took parts 1 and 2 while at the University and part 3 during their internship, scoring near the national average for all medical students and achieving pass rates that were equal to or better than the pass rates for all medical students, as shown in table 3.1.

Table 3.1: Results of USMLE Taken by the University's 1993 Graduating Class

	Part 1	Part 2	Part 3
USU average	199[a]	195[b]	497[c]
National average[d]	200	200	480
USU pass rate	92%	94%	97%
National pass rate	88%	94%	96%

[a]Scores are reported on an open-ended scale, with the mean usually about 200; passing score was 176.

[b]Scores are reported on an open-ended scale, with the mean usually about 200; passing score was 167.

[c]Scores are reported on an open-ended scale, with the mean usually about 500; passing score was 310.

[d]Includes graduates of Canadian medical schools.

The classes that graduated in 1994 and 1995 had completed only parts 1 and 2 of the examination at the time of our review. The results of those tests are shown in table 3.2.

Table 3.2: Results of USMLE Taken by the University's 1994 and 1995 Graduating Classes

	1994		1995	
	Part 1	Part 2	Part 1	Part 2
USU average	201	197	203	198
National average	200	200	203	198
USU pass rate	96%	95%	97%	96%
National pass rate	89%	93%	91%	92%

University Graduates Perform Well During Internship

The three military services operate GME programs. During the internship (the first year of GME), physicians are evaluated 13 times. We reviewed the evaluations for all interns at the Air Force's Malcolm Grow Medical Center, the Walter Reed Army Medical Center, and the Bethesda National

Naval Medical Center for the academic year 1993-94.[16] On average, for the sample we reviewed, interns who graduated from the University received similar or higher evaluations than interns who graduated from other medical schools, as shown in table 3.3.

Table 3.3: Intern Evaluations for 1994

	Air Force	Army	Navy
Average evaluation for USU graduates[a]	5.63 (15)[b]	87.53 (9)	3.86 (25)
Average evaluation for other interns	5.26 (6)	86.02 (49)	3.81 (37)

[a]Air Force interns were evaluated on a 7-point scale, the Army interns on a 100-point scale, and the Navy interns on a 4-point scale.

[b]The number of interns evaluated is in parentheses.

Military Medical Commanders View University Graduates and Other Military Physicians as Comparable Clinicians

We contacted 24 commanders of the largest military hospitals, most of whom believe that University graduates equal their civilian-educated colleagues in terms of overall clinical capabilities. Typical was the remark made by the commander of an Army hospital:

"The graduates of [the University] demonstrate the same spectrum of abilities and clinical aptitude as the graduates from any of our best civilian medical institutions. I have seen no difference in intellect or performance."

Others noted less variation in the quality of University graduates. For example, the commander of an Army medical center said

"The [University] graduates are of a more consistent level of quality [compared with] a spectrum of abilities that come from the variety of civilian medical school sources."

Adverse Actions Among University Graduates Are Few

DOD tracks adverse clinical privileging actions as an indicator of the performance of military physicians. Adverse clinical privileging actions can involve a range of activities such as malpractice, drug abuse, or unprofessional conduct. Based upon our analysis of data maintained by the Armed Forces Institute of Pathology, physicians who graduated from the University have had fewer reported adverse clinical privileging actions than military physicians from other sources. From 1982 to 1994, University graduates had 19 reported actions, or 1.48 actions per 1,000 physician staff

[16]These programs, all in the Washington, D.C., area, represent only a small portion of the military's internship programs. We cannot project the results of our analysis to other military internship programs or to other years of the three programs in our analysis.

years. During that same period, physicians from the scholarship program had 234 actions, or 3.06 actions per 1,000 physician staff years.

University Students Receive Extensive Medical Readiness Training, but Its Impact Is Unclear

Preparing physicians for the special needs of military medicine involves education, training, and experience beyond that of a traditional medical education. This additional preparation is broadly referred to as medical readiness training.[17] Our analysis shows that the medical readiness training provided to University medical students is more extensive than that initially given to other military physicians in terms of the amount of time involved and the nature of the training. Leaders in military medicine that we contacted consider University graduates to be better prepared for military medicine, at least during the early years of their careers. However, University and DOD officials do not know of any objective evidence that shows that the extensive readiness training at the University produces physicians who are better prepared than their peers to meet the special needs of military medicine.

Readiness Training at the University Is More Extensive Than That Given to Other New Physicians

Military physicians currently receive their initial readiness training through one of two means: University medical school students receive medical readiness training as part of their 4-year medical education; graduates of civilian medical schools receive it by attending medical readiness training courses that the services offer individually or jointly. The medical readiness training given to University medical students is more extensive in volume and breadth than the initial medical readiness training for other physicians.

University Students Receive More Hours of Initial Readiness Training Than Other New Military Physicians

According to University officials, the University's curriculum is intended to provide the medical and military knowledge and capabilities that the curriculum developers felt was necessary to prepare a physician to function in a leadership role in a range of operational assignments and environments. At our request, University officials identified the hours of its curriculum devoted to medical readiness topics. According to those officials, University medical students receive an estimated 734 hours of readiness training (including both classroom and field exercises). They also receive at least 50 hours of medical readiness training during the officer basic training that they are required to attend before beginning

[17]As used in this report, medical readiness training refers to any education or training (including basic officer training) designed to enhance the knowledge and skills of health care personnel in concepts of military medicine.

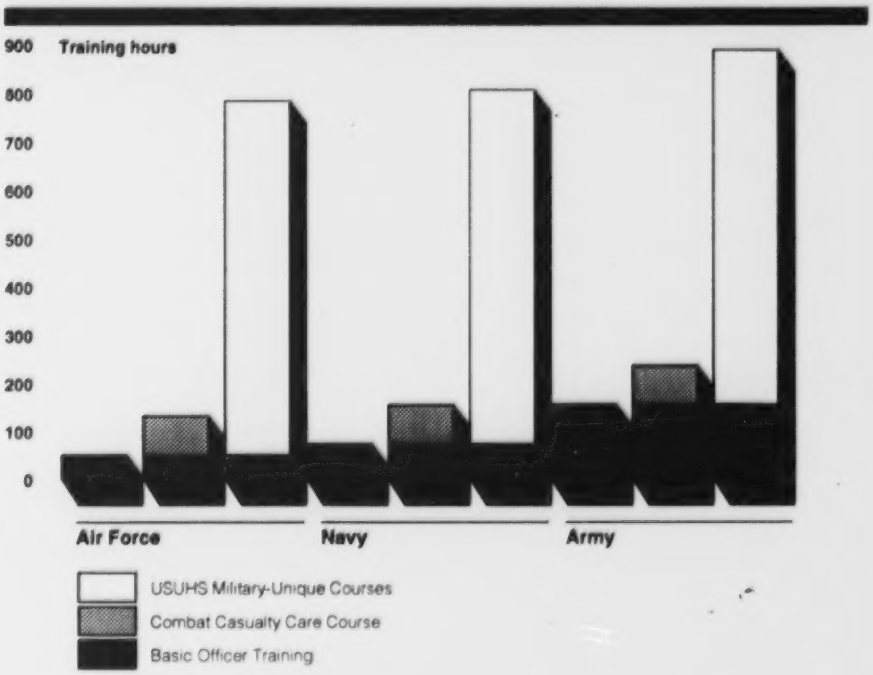
their first year at the University.[18] Thus, by the time they graduate, University medical students have received between 784 and 889 hours of readiness training, depending upon the service branch involved.

Service training officials and guidance indicate that the objectives of the initial readiness training usually provided to other military physicians are to teach physicians the fundamentals of military officership and the basic skills needed to treat combat casualties on the forward points of the battlefield. New military physicians who are graduates of civilian medical schools typically receive less initial readiness training than that provided to University students. For example, Air Force physicians who attend only the required basic officer training receive 50 hours of readiness training. If they were to also attend the optional Combat Casualty Care Course (C4), the total number of hours would increase to about 132 hours.[19] Figure 3.3 compares the total number of hours of initial readiness training depending upon the source or sources through which the training was acquired.

[18]Some University students, such as those with prior commissioned service, may not be required to attend basic officer training.

[19]Regardless of the source of their initial readiness training, all military physicians can take additional readiness training courses to sustain and enhance their knowledge and skills. In the past, however, physicians have not always attended even required readiness training.

Figure 3.3: Comparison of Initial Readiness Training by Training Source



Some Readiness Topics Covered at the University Are Not Covered by Initial Readiness Training for Other New Physicians

The portions of the University's curriculum related to military medicine cover 17 broad areas, some of which are primarily medical in nature, some of which are primarily military. With less total time spent on initial readiness training, the amount of time spent on any individual topic generally is less for other physicians than for students at the University. However, some of the topics that the University program covers receive no coverage in the initial training given to other physicians (either in basic officer training or C4.) For example, the two areas that receive the most coverage in the military portion of the University's curriculum are tropical medicine (66 classroom hours) and weapons effects (59 classroom hours.) Tropical medicine is not covered by the initial readiness training for other physicians in any service. Air Force physicians receive 30 minutes of coverage on weapons effects as part of their initial training; Army and Navy physicians receive none. Appendix II compares the hours of training provided by each source.

University and other DOD officials view the difference between the University's program and the medical readiness training provided to other

military physicians to be more than a matter of extent and content. These officials point out that the information the University provides concerning military medicine is interwoven throughout all of its classes, including the basic sciences—not merely in the classes dedicated to military medicine. They view the University's program as fundamentally different from readiness training in that it is a complete program of education.

Commanders View University Graduates as Better Prepared for Military Medicine

We obtained the perspectives of 44 commanders of major military medical units about the relative capabilities of University graduates and their civilian-educated peers. The responses received were narrative in nature and did not lend themselves to tabulation. However, the overall tenor of the comments was favorable to the University, even though most of the respondents were graduates of other accession programs.[20]

According to nearly all the medical commanders that we contacted, University graduates are at least initially better prepared for military medicine when compared with their peers. Only one commander viewed University graduates as no better prepared than their peers for the practice of military medicine. The remainder perceived, among other things, that physicians from the University have a greater overall understanding of the military, greater commitment to the military, better preparation for operational assignments, and better preparation for leadership roles. Some commanders noted that the advantage of the University medical education diminishes over time. Others expressed the view that the University and civilian medical schools should be regarded as complementary accession sources.

Commanders Believe University Graduates Have a Greater Understanding of the Military and Their Role in It

Many of the medical commanders believe that, compared with other military physicians, University graduates have a better understanding of the military mission, organization, and customs. They also said that they perceive that University graduates have a better appreciation of and greater satisfaction with the physician's role within the military. Others remarked that because of their greater overall knowledge about the military, University graduates are more easily assimilated into it. Some noted that this better understanding of the military mission and related matters gives University graduates greater credibility with the nonmedical personnel whose needs they serve. Commanders said that they view University graduates as more committed to the military and to a military

[20]Respondents were asked to describe their military experience and background. Some respondents identified their accession source in their written comments.

career. This commitment was sometimes attributed to the longer pay-back requirement associated with the University. Typical of such observations is the following from the commander of an Army deployable medical unit:

"[The University] produces physicians that are not only technically competent, but are also able to quickly function as . . . military officer[s]. They are already familiar with the military corporate culture, which enhances their credibility and allows them to progress more rapidly into leadership positions. Civilian graduates are less equipped to do so and, in many cases, have no interest in doing so."

Further, the commanders generally stated that they value the University graduates, as a group, because they view them as a cadre that provides a source of stability and continuity in military medicine. University graduates were generally perceived as possessing more of the technical knowledge and skills needed in operational assignments. The commander of an Army deployable medical unit remarked that

"[University] graduates . . seem to adjust better to field conditions when deployed for operations or exercises. Having had some experiences with field medicine during their training, they know what to expect when they are called to a battalion aid station to provide support. The civilian school physician is often shocked by . . . [the] first encounter with field medicine in terms of the austerity and the age of the equipment and pharmaceuticals he is expected to use. In a combat or [other operational] scenario, that initial shock can be disastrous for the patients unless the physician adjusts quickly and learns to make do with what is at hand."

Commanders Perceive University Graduates to Be Better Prepared to Assume Leadership Roles

The commanders generally viewed University graduates as better prepared than their peers for leadership roles. They also saw them as better team players. In their roles as leaders and team players, commanders noted the willingness of University graduates to share their knowledge in military medicine with their peers. Because the University graduates are willing to share their knowledge, the commanders said that their presence enhances overall readiness among civilian-educated physicians and other health care providers. Some commented on the importance of the acculturation process, which they believe occurs during the 4 years of medical education at the University. Several commanders expressed the view that the advantages of a medical education from the University would diminish over time as the civilian-educated physicians acquired additional training and experience. The commander of an Army deployable medical unit commented that

"[University graduates] generally seem better prepared for field duty during the first few years of service. . . . [University] students are taught military bearing and know how to act around soldiers. As time passes, the advantages of being schooled in a military environment become less apparent and do not appear to play a role after the two or three years that civilian graduates take to become accustomed to their Service requirements."

Finally, several respondents said that the University and scholarship programs should not be viewed as competing; rather, they viewed them as both necessary and complementary. As expressed by the command surgeon of a unified command:

"[The University] is necessary to provide a corps of physicians who have the knowledge base and experience to practice medicine in a military environment. This will provide a substantial amount of tomorrow's leaders. But I don't want to underemphasize the importance of the civilian-trained physicians. They bring in a wealth of diverse training that ensures the services will have personnel experienced in the latest procedures and techniques of civilian medicine."

Objective Information Is Lacking About the Effectiveness of the University and Other Readiness Training

Objective evidence is lacking concerning the relative effectiveness of the University and traditional readiness training programs. Neither University officials nor others we contacted within DOD were aware of any specific studies done for the purpose of comparing the effectiveness of the two approaches for providing readiness training. They were also not aware of databases that track information that would permit such an analysis.

University officials said that they do not have a formal process in place to assure themselves that the military portions of their curriculum are appropriate to meet the needs of their customers. They do not seek an official endorsement of their curriculum by the services or DOD (although the Board of Regents includes the Surgeons General and a representative from the Office of the Assistant Secretary of Defense, Health Affairs.) The validity of other medical readiness training is uncertain as well. For example, the Chief of the Joint Medical Readiness Training Center (which administers C4) said that C4 has remained essentially unchanged since its start in 1980.

The ultimate measure of a physician's medical readiness is performance in an actual military deployment. We and others have reported that physicians were not adequately qualified for immediate deployment to Operation Desert Shield/Desert Storm because they lacked the required

readiness training.[21] For those physicians who were deployed, readiness skills were not comprehensively tested because the military suffered few casualties. Likewise, other recent deployments have not fully tested physician readiness capabilities to the extent that could be expected in a major conflict. In peacetime, the services have not routinely assessed the readiness capabilities of their physicians. Thus, neither recent actual deployments nor peacetime simulations have provided a basis to compare the performance of University graduates with their civilian-educated peers.

DOD and the services lack agreement concerning the medical readiness knowledge and capabilities that physicians need. The services offer training courses to enhance and sustain the medical readiness capabilities of physicians; however, only one course—officer basic training—is explicitly required for all military physicians. Without agreed upon standards, the validity and effectiveness of University and other readiness training programs cannot be readily assessed. While University graduates have more readiness training than their contemporaries, the value of that training to DOD and the services cannot be objectively assessed from a requirements standpoint.

In March 1995, DOD recognized the need for improvements in medical readiness training and set out to develop and establish medical readiness requirements and standards.[22] Only against such standards can the validity of the current program at the University and of the training provided by the services be fully assessed.

[21]Operation Desert Storm: Full Army Medical Capability Not Achieved (GAO/NSIAD-92-175, Aug. 18, 1992); Operation Desert Storm: Problems with Air Force Medical Readiness (GAO/NSIAD-94-58, Dec. 30, 1993); and Operation Desert Storm: Improvements Required in the Navy's Wartime Medical Care Program (GAO/NSIAD-93-189, July 28, 1993).

[22]Medical Readiness Strategic Plan 1995-2001, Office of the Assistant Secretary of Defense, Health Affairs (Washington, D.C.: 1995). DOD has a draft instruction that is intended to set standards regarding military medical readiness skills training.

Other Activities of the University

To help meet LCME standards required for accreditation as an academic institution, the University engages in several activities in addition to operating its School of Medicine. These fall generally into two major categories: (1) education and training activities and (2) research, consultation, and archival activities. Financial support for these activities, mostly the salaries and benefits of the University's faculty and staff, is provided through the University's general budget process. Although these are included in our computation of the cost to educate University medical students, we did not evaluate these activities in detail.

In response to advances in science and medicine, medical schools have assumed responsibility for or participated in other programs in medicine and related fields that complement their programs leading to the Medical Doctor degree. LCME believes that the education of medical students is best conducted in such enriched environments. Our review of University documents and discussions with University officials showed that the University conducts several activities that correspond to LCME standards.

Currently, the University is the only military organization conducting some of these functions, such as providing overseas physicians with required continuing medical education and maintaining a database on casualty wound treatment cases. University officials stated that if the University was not performing these roles, DOD would need to identify other providers.

Education and Training Activities

The University provides medical education beyond that provided by the School of Medicine and also conducts training and education for other health care and related professions. This mission is consistent with the LCME standards that medical schools should include programs for postdoctoral fellowships, graduate education in the basic medical sciences, continuing education for physicians, and education in other health professions and allied fields.

Office of Continuing Health Professional Education

Health professionals, particularly physicians, must acquire certain levels of continuing education to maintain their licenses. In fiscal year 1994, according to a University report to the Office of the Secretary of Defense, the University's Office of Continuing Health Professional Education conducted about 600 continuing educational programs, attended by about 11,000 individuals, mostly military physicians. The largest programs are provided for physicians in Europe, East Asia, and the Pacific, thereby

avoiding the costs of these physicians traveling to U.S. facilities for training. Examples of the courses provided include video endoscopy, obstetrics ultrasound, and laparoscopic cholecystectomy.[23] The University is also developing the use of videoconferencing and computer networking to present its training. The University also provides certification for those trained in cardiac resuscitation courses.

Graduate Medical Education

LCME accreditation standards also encourage medical schools to provide or be affiliated with institutions that provide programs in GME. (As mentioned in chapter 1, GME programs, which are usually 3 to 7 years in duration, provide physicians training in their chosen specialty.)

The University is the academic affiliate for several military GME programs, including three in the Washington, D.C., area, providing faculty development, research, curriculum enhancement, and patient care. In addition, the University's Office of Graduate Medical Education conducts DOD-wide consultation and oversight for 11 GME programs sponsored or co-sponsored by the University. DOD plans to assign the University with other responsibilities to ensure that military GME programs maintain their standards of quality for a smaller military force.

Graduate Education in Basic Sciences

In addition to its continuing education offerings, the University offers master's and Doctor of Philosophy (Ph. D.) programs in anatomy, biochemistry, pharmacology, and other sciences. Between 1977, when the first students were admitted, and 1994, the University awarded 128 Ph.D. and 238 master's degrees. These graduates form a pool of researchers and potential instructors at the University or other institutions. The University also conducts smaller, more specialized programs, such as a Ph.D. program in clinical psychology for selected military officers.

Graduate School of Nursing

The 1993 Defense Appropriations Act directed the University to implement a training program for nurse practitioners. Currently, the University operates accredited masters' nurse programs for family nurse practitioners and for nurse anesthetists. The students are military officers who incur 4 additional years of obligated service for the 2-year course. The number of students entering the program are shown in the following table.

[23]Endoscopy is the inspection of the inside of a hollow organ or cavity using an endoscope—a device consisting of a tube and an optical system. Laparoscopic cholecystectomy is gall bladder surgery using endoscopic procedures.

Table 4.1: Number of Graduate Nursing Students Entering in Fiscal Years 1993-96

Fiscal year	Family nurse practitioners	Nurse anesthetists
1993	3	0
1994	12	9
1995	12	12
1996 (estimate)	12	20

Research, Consultation, and Archival Activities

The University conducts several research and archival activities both to meet its accreditation requirements and to advance the practice of military medicine. The research, consultation, and archival activities are conducted by faculty and staff in many departments of the University, including special centers for (1) casualty care research, (2) traumatic stress studies, and (3) preventive medicine and public health. The activities of each of these centers are summarized below.

Casualty Care Research Center: This center researches and investigates issues related to injury control, casualty care, and disaster medicine. The center employs medical and graduate students and full-time staff to conduct its research, maintain a database of casualty care cases, and provide consultation to other federal, state, and local government agencies.

A key activity of the Casualty Care Research Center is the Counter Narcotics Tactical Operations Medical Support program—a week-long course for emergency medical technicians and paramedics who operate as part of tactical law enforcement teams. Among other topics, this course covers medical care while under fire, hostage survival, effects of ballistic wounds, and evidence preservation. The staff also provides consultation to law enforcement agencies.

Another mission of this center is maintaining the Wound Data and Munitions Effectiveness Team, which contains information on the tactical engagement, weapons employed, resulting injuries, and treatment of approximately 8,000 Vietnam combat casualties. Its collection of photographs, X rays, recovered bullets, and other data is the only one of its kind.

Center for Traumatic Stress Studies: This center conducts research, maintains archives of medical literature, and provides consultation for psychiatric responses to trauma and disasters. Staff also collect on-site

data to facilitate longitudinal follow-up on disasters and traumatic events. To illustrate, in 1992 a University psychiatrist traveled to Florida within 48 hours of Hurricane Andrew to provide emotional assistance to base personnel and evacuees from Homestead Air Base. To increase its knowledge in helping future victims, the University has surveyed participants in military engagements (such as the Gulf War) and natural disasters (such as Hurricane Andrew) to identify their emotional problems and how to help them.

Centers for Preventive Medicine and Public Health: These centers develop databases and analytic methodologies, and prepare curricula for and evaluate processes and outcomes in clinical practice. They serve program managers and policymakers in DOD, other federal agencies, local governments, and private organizations concerned with health policies and services. These centers address topics that receive little attention in many civilian medical schools but are critical to the practice of military medicine, such as foreign area medical studies, landscape epidemiology, and health in extreme environments.

DOD's Retention Needs Are Unknown

DOD's need for physicians has changed as a result of the emergence of smaller regional threats at the end of the Cold War and the overall downsizing of the military in response to large budget deficits. Our review of DOD retention data shows that University graduates have the longest expected retention among physicians from the various accession sources. Because a higher percentage of University graduates are expected to reach retirement (20 years), they contribute to DOD's long-term need for physicians and for medical specialists considered critical for wartime needs. Scholarship program graduates, who are the largest source of military physicians, generally have shorter careers.

Although DOD is reevaluating its future need for physicians, it has not reached conclusions about the number of physicians needed or the optimal length of time that physicians should serve. While the longer pay-back obligation of University graduates is a key factor in their retention, factors such as age, marital status, compensation, nonphysician duties, and working conditions have also been associated with physician retention. If DOD continues to need a cadre of experienced career physicians, alternative strategies such as an enriched scholarship component could be considered as a potentially more cost effective way to meet DOD's long-term need for physicians.

University and Scholarship Program Retention Patterns

In 1972, when the University and the scholarship program were authorized, the University was expected to supply DOD's long-term needs for military physicians, while the scholarship program would supply the majority of physicians for short-term needs. Early graduates of both accession programs are still several years from retirement eligibility. Our efforts to determine whether graduates of both programs had satisfied their pay-back obligations were hampered by incomplete information on other service commitments created by factors such as prior service, academy attendance, or extended GME training. We reviewed DOD's retention databases to obtain estimates of the expected retention patterns for University graduates and scholarship program physicians. These databases incorporate information from retention experiences to date for University and scholarship program physicians and projections of their future retention based on historical experiences of physicians from other accession programs.

Retention Rates for Scholarship Program Physicians

DOD has offered scholarships since 1973, but few scholarship program graduates have served for 20 years to qualify for retirement. Our review of DOD retention data shows that regular scholarship program graduates on

average are expected to provide 9.8 years of service, while deferred scholarship program graduates serve 5.3 years on average. Further, using DOD retention data, we project that 11 percent of the regular scholarship program and 3 percent of deferred scholarship program physicians from the class of 1994 will reach retirement.

Retention Rates for University Graduates

DOD's retention experience with University graduates is also limited because the first class graduated in 1980. As a result, the most senior alumni have only 15 years of service.[24] The DOD retention databases show University graduates are expected to provide about 18.5 years of service, and about 50 percent of University graduates are expected to stay on active duty service for 20 years or longer. The longer expected retention of University graduates is consistent with the legislative intent of providing long-term military medical officers. In addition, our analysis of DOD retention data shows that University graduates are retained at a higher rate in the medical specialties considered critical for the wartime mission.

University Graduates Will Likely Comprise Large Portion of Peacetime Medical Cadre

University graduates are expected to comprise a significant portion of the medical cadre needed for long-term leadership. For example, although University graduates were about 14 percent of the physicians who graduated in fiscal year 1994 (the remaining 86 percent being scholarship program participants), they are expected to comprise 47 percent of the members from this class who stay 20 years or longer.

University Graduates Have Greater Retention in the Critical Medical Specialties

University graduates also have greater retention in those medical specialties considered critical for war. Current readiness planning considers the medical specialties of anesthesiology, orthopedic surgery, and general surgery to be critical for the wartime need. However, physicians in these specialties historically leave the military at faster rates than those in other specialties. For example, Navy officials estimate that, each year, the Navy loses about 22 percent of physicians in these specialties, compared with an annual 11 percent loss for all physicians. A review of Army data shows that a larger percentage of University graduates are retained in these critical specialties than are graduates of the scholarship program.[25] The Army data show that, on average, 31 percent of University graduates in the three critical medical specialties

[24]Data maintained by the University show that 81 percent of its physicians who graduated between 1980 and 1985 have remained on active duty.

[25]Neither the University nor the scholarship program train graduates to be medical specialists.

will stay 20 years, compared with 12 percent from the regular scholarship program and 2 percent of deferred scholarship program graduates.[26]

DOD Is Evaluating Its Overall Need for Physicians

DOD's ability to adapt to the changing nature of operational scenarios and the challenges of providing cost-effective peacetime health care will be key factors in determining physician needs for the military. Although recent DOD studies suggest that large reductions have occurred in the overall number of physicians, these studies do not indicate the optimal retention needed for physicians from the various accession programs.

DOD Study Suggests Lower Active Duty Need

DOD's evaluations of its future physician needs have not led to conclusions about the number of physicians required or optimal retention patterns. The catalyst for these evaluations was section 733 of the National Defense Authorization Act for fiscal years 1992 and 1993, which required DOD to conduct a study to, among other things, determine (1) the size and composition of the military medical system needed to support U.S. forces during a war or other conflict and (2) the adjustments needed for cost-effective delivery of medical care to covered beneficiaries during peacetime. DOD's study (referred to as the 733 study) estimated that DOD has as many as 3 times the number of physicians it needs during peacetime to meet projected wartime requirements, as shown in table 5.1.

Table 5.1: Active Duty Physician Requirements as Portrayed in the 733 Study

	Programmed for fiscal year 1999	733 study base case	733 study augmented during peacetime
Active duty physicians	12,600	4,000	6,300
Percent difference from 1999 program	Not applicable	-68%	-50%

The base case in DOD's study represents a 68 percent lower requirement than DOD's fiscal year 1999 program plan suggests, but refers only to those active duty physicians needed to administer care to wartime casualties. It excludes the additional numbers of physicians needed for readiness during peacetime (the augmented case). In the augmented case, the study concludes that the number of active duty physicians could be lower by 50 percent.

[26]DOD-wide data were not available.

The 733 study results immediately prompted a review by the services of their physician needs. Although the services have not disagreed with the 733 study results, their individual efforts produced higher estimates of physician needs, primarily because their reviews were based on different assumptions than were used in DOD's study. Our review of the 733 study and the service's responses[27] found that even if the services' assumptions are correct, the resulting requirements for military physicians would be less than are currently planned for in 1999. The 733 study did not present a precise estimate of DOD's needs or a precise guide for deciding which medical personnel, units, and capabilities are no longer required. Issues such as these must be resolved before DOD can make decisions about its retention needs.

Some Downsizing Has Occurred

Since 1991, the total active duty physician force has dropped about 4 percent, from about 14,200 in 1991 to about 13,700 in 1994. Further reductions to about 12,600 are scheduled by 1999 (11 percent overall). However, according to service officials in the Offices of the Surgeon General, most of the reductions between 1991 and 1994 were due to the normal attrition of physicians through retirement, resignations, and administrative leave. Navy officials also said some physicians were allowed to transfer from active duty to reserve status, mostly as a result of base closures.

These reductions in active duty physicians are slight when compared with reductions in the entire force over the same period. Between 1991 and 1994, total military endstrength dropped about 20 percent, from 2.0 million to 1.6 million, and is expected to drop to 1.45 million by 1999 (about 28 percent). Service officials cited congressionally imposed limits with respect to reductions of health care personnel and DOD's continuing responsibility to provide care to beneficiaries of DOD's health care system as reasons why greater reductions have not occurred in the physician force.

DOD Required to Certify Excess Need

Section 711 of the National Defense Authorization Act for fiscal year 1991 prohibits reductions in military (and civilian) health care personnel below the number of such personnel serving on September 30, 1989, unless DOD certifies to the Congress that (1) the number of personnel being reduced is in excess of current and projected needs and (2) that the reduction will

[27]Wartime Medical Care: Aligning Sound Requirements With New Combat Care Approaches Is Key to Restructuring Force (GAO/T-NSIAD-95-129, Mar. 30, 1995).

not increase costs in the $3.6 billion DOD-administered health insurance program for beneficiaries—the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). DOD is also prohibited from reducing the number of Navy active duty medical officers to fewer than 12,510 (including nonphysicians) unless DOD certification is accomplished.

Our review of the DOD certification documentation for fiscal years 1991 to 1995 indicated that the Army has led in the reduction of its physician force. In fiscal year 1995, the Army was given authority to reduce its physician force by 553 physicians after certifying this number was in excess of their requirements and would not result in increased CHAMPUS expenses. The Assistant Secretary of Defense for Health Affairs, as part of the fiscal year 1995 DOD certification, requested the repeal of all legislative provisions that prohibit medical staff reductions.[28] Officials in the Navy and Air Force stated that they have not sought to reduce the number of physicians because they have not been able to obtain and retain the targeted number of physicians they believe they need.

Tricare May Affect Peacetime Needs

For several years, DOD has been testing alternative approaches to delivering health care that increasingly incorporate managed health care techniques. In this regard, DOD recently established its TRICARE program as an alternative to the traditional CHAMPUS fee-for-service health insurance plan covering beneficiaries of active duty members. TRICARE is intended to provide an economical source of medical care for all DOD beneficiaries even as medical service endstrength is reduced. A key component of TRICARE involves contracting with civilian health care providers for beneficiary health services. If TRICARE is successful, it could result in a reduced need for active duty physicians as more care is provided by civilian contractors. Progress made in the implementation of TRICARE was one of the reasons mentioned by the Assistant Secretary of Defense for Health Affairs for the proposed repeal of legislative provisions that prohibit medical staff reductions.

Factors Influencing Physician Retention

University graduates are retained in the military at higher rates than other accession sources largely because of their longer pay-back obligations. Also, some University students, such as those who graduate from the military academies and the Reserved Officer Training Corps (ROTC) programs, have existing obligations before becoming University students.

[28]DOD officials said that the repeal was not granted for fiscal year 1995, but is currently being discussed by the Congress.

Overall, many factors are associated with the decision to make the military a career, including demographic and personal concerns such as age and family considerations, compensation, and nonphysician activities.

Longer Pay-Back Requirements Contribute to Higher Retention of University Graduates

Although DOD's retention data indicate a relationship between retention and accession source,[29] the data do not indicate the reasons why these patterns occur. However, the longer obligation pay-back requirement is a key factor in the longer retention of University graduates. University graduates are expected to serve for about 11 years after graduation, including GME training, before they are first able to leave military service; compared to about 8 years for the regular scholarship program and 4 years for deferred scholarship program graduates. This longer pay-back obligation period is expected to lead many University graduates to decide to serve another 9 years until they are able to retire. University officials said the longer retention may be partially due to their recruitment criteria, under which they specifically attempt to select people who express an interest in making the military a career. Hence, the longer retention is consistent with students' stated intentions.

Prior military obligation on the part of some of its students may also influence University retention. Two 1994 military studies[30] identified military academy backgrounds, prior military experience, University attendance, and fellowship training[31] as predictive factors in the retention of physicians in certain specialties. About 21 percent of all students at the University have attended the military academies or participated in ROTC programs. We previously reported that retention of these officers, regardless of profession, is high.[32] Another 25 percent of all University students had prior military experience in that they were either currently on active duty at the time they enrolled or they had prior active duty or reserve experience.

[29]Retention rates also vary by service and medical specialty.

[30]"Retention Rates and Retention Predictors Among Graduates of Army Family Practice Residency Programs," Steinweg, Kenneth K., Journal of Military Medicine, Vol. 159 (July 1994), pp. 516-519), and "Retention of Internal Medicine Physicians in the U.S. Army, Zaloznik, Arlene J., Journal of Military Medicine, Vol. 159 (July 1994), pp. 520-523.

[31]Fellowship training is advanced GME that prepares a physician for a medical or surgical subspecialty.

[32]Officer Commissioning Programs: More Oversight and Coordination Needed (GAO/NSIAD-93-37, Nov. 6, 1992).

Many of these predictive factors could apply to scholarship program graduates as well. For example, Army scholarship program officials suggested that the retention experience of ROTC and military academy graduates in the scholarship program is similar to that of University graduates from the same sources. Moreover, scholarship program recruiters also look for people who are interested in making the military a career. Lower retention among deferred scholarship program graduates has been attributed to the fact that they are better able to network in the civilian sector during their civilian GME programs and create private sector opportunities for themselves. One DOD official who has contributed to a number of DOD retention studies believed the retention patterns for all physicians who stay 12 years is about the same, regardless of accession source.

Other Factors Affecting Decisions About a Military Career

Many other factors influence physicians' decisions to stay in or leave the military. For example, personal characteristics, such as age and sex, family considerations, and working conditions have all been found to influence physicians' decisions. More often than not, financial considerations have been identified as a significant factor in retention. For example, in 1990, we conducted a survey of 1,500 military physicians to determine the factors that most influence their decisions to leave the military.[33] Time spent on nonphysician tasks and gaps between military and civilian compensation were the most significant factors identified. Physicians also reported dissatisfaction with other aspects of military service, such as poor hospital equipment, the inability to provide continuity of care to patients, excessive amounts of quality assurance tasks, and limited opportunities to attend professional meetings and training.

Although many factors affect retention, a key DOD official involved in DOD retention studies said that the options available to DOD to change retention patterns are limited. For example, there may be little that can be done about dissatisfaction with quality assurance procedures because these are needed for hospital accreditation. The official also said that even in those areas where DOD might have some control, such as physician compensation, there are limits on the amounts that DOD can pay. Moreover, he believes that for some medical specialties, DOD could not match the compensation that these physicians could earn in the private sector.

[33]Defense Health Care: Military Physicians' Views on Military Medicine (GAO/HRD-90-1 Mar. 22, 1990).

Other studies that examined why physicians stay in the military identified the following reasons: the availability of teaching assignments and clinical research opportunities; lack of worry about malpractice and office management problems; more control over working hours; the collegial atmosphere of military medicine; and the opportunity to travel.

Alternative Strategies to Meet DOD's Long-Term Physician Needs

Proponents of the University note that the University meets DOD's need for a small cadre of experienced military officers and leaders who, in their opinion, are better prepared for the special needs of military medicine. If the University is closed and DOD continues to need experienced career military physicians, DOD will need to find alternative ways to extend the careers of some military physicians while enhancing their exposure to military readiness training.

One approach could involve an enriched component to the scholarship program which would require a longer pay-back obligation for selected students in return for additional benefits, training, and military career opportunities.[34] Additional readiness training could be provided through a post graduate period specifically designed to enhance the physician's preparation for the special needs of military medicine. Through this type of two-tiered scholarship approach, DOD could address its short- and long-term requirements for military physicians.

[34]GAO did not determine if scholarship students would have been willing to accept scholarships if their service obligation periods were longer. Under this alternative strategy, the current elements of the scholarship program, including the service obligation requirements, would not need to be changed for the majority of scholarship applicants. The change in service obligation requirements could apply to a small subset of scholarship applicants who would be specifically recruited for longer military careers.

Conclusions

When the University and the scholarship program were authorized by the Congress in 1972, following the end of the military draft, they were intended to be complementary physician accession programs.

- The University was established to meet the need for a small cadre of physicians who would be likely to become career military officers and leaders.
- The scholarship program was authorized to provide a continuing and larger supply of military physicians who would, for the most part, not be expected to serve until their retirement.

Notwithstanding the intended complementary nature of the two physician accession programs, the comparative cost-benefit and cost-effectiveness of the programs have been the subject of debate ever since their authorization.

Our prior work, this report, and several studies by other groups over time show that by most measures the University program is a more costly physician accession program than the scholarship program. Nevertheless, those who advocate the continuation of the University make strong arguments that the need for a cadre of military physician career officers and leaders remains, and that the University fulfills that need well. University supporters also note that in addition to providing a high quality medical education, the University provides other benefits such as medical research and archival programs, required continuing medical education for overseas medical personnel, and graduate education programs for allied health professionals. University officials stated that if the University were not performing these tasks, other DOD components would have to be tasked to carry them out.

The early retention history for University graduates indicates that the majority of them are still in the military and fulfilling their service obligations. Also, our review of DOD's retention analyses shows that the University would likely continue to meet DOD's needs for a cadre of military physician career officers. However, based on our review of available information, we believe that if the University were closed, these needs could be fulfilled by alternative strategies, such as adjusting the pay-back requirements of scholarship students, revising the training approach for those students to incorporate additional military unique training sessions, or doing both.

In our view, issues relating to the changed need for military physicians in war and peacetime settings are important factors to be considered as decisionmakers debate the future of both the University and scholarship programs. The changed wartime scenarios, which point to a reduction in the number of physicians needed to meet contingency requirements should, in our opinion, be taken into account as the future existence and the possible size of the accession programs are determined. Moreover, DOD's attempt to meet its peacetime care obligations to military beneficiaries through increased reliance on its TRICARE managed care program will also affect the number and type of physicians that DOD needs.

Matter for Congressional Consideration

The Administration's National Performance Review has proposed that the University be closed. This proposal has presented the Congress with difficult policy decisions regarding the need for a cadre of physicians who are likely to become career military officers and the most appropriate means of retaining those physicians.

As Congress makes those decisions, it may wish to consider requiring DOD to justify both the University and the scholarship program in the context of DOD's specific short- and long-term requirements for military physicians, the role of the University and the scholarship program in satisfying those requirements, and their relative costs.

Agency Comments

We obtained comments on a draft of this report on September 15, 1995, from the Assistant Secretary of Defense, Health Affairs, and his staff and from the University's President and other top University officials.

The Assistant Secretary stated that the report presents a great deal of factual data and reflects a significant research effort in its collection and compilation. Both the Assistant Secretary and University officials were concerned, however, about several presentational issues including what they viewed as

- a focus in our comparative cost analysis on the cost per graduate of each program, rather than on the total cost to the taxpayer per staff year of DOD service, which they believe is the appropriate measure of cost;
- a lack of emphasis on the activities of the University, which results in cost-avoidance for other DOD components; and
- a lack of emphasis on the University's unique contribution to providing military physicians schooled in militarily unique medical subjects and our

failure to acknowledge the "acculturation process" provided by the University in meeting the needs of military medicine.

In response to our matter for congressional consideration, the Assistant Secretary stated that, although the position of the Administration and the Department is that the University should be closed, the Department noted our recognition of the different goals of the two programs and their complementary nature. He also stated that the Department does not believe additional justification is needed for the University and scholarship program and that the need for a long-term experienced cadre of military physicians produced by the University and short-term physicians will continue.

Regarding the first concern of DOD and the University, we recognized that there can be and, in fact, have been several units of measurement used to compare the relative costs of DOD's physician accession programs. Rather than offering one unit of measurement, we have presented, in an iterative way, several units of measurement that we believe present a complete comparative analysis of the programs.

We have revised the report to further emphasize the cost-avoidance activities of the University but, as stated earlier, we did not validate the University's estimates of cost-avoidance.

The Assistant Secretary and University officials were concerned that we had not appropriately emphasized the University's unique contribution to military medicine. In response, we have revised the report to reflect the University's approach to providing a complete education in military medicine and made minor adjustments to the draft report. These adjustments were designed to attribute statements about the unique needs of military medicine and the University's contributions without appearing to question the credibility of our sources. However, we believe that judgments regarding the relative emphasis placed on various issues discussed in the report must be based on the evidence at hand. In this case, the evidence was based primarily on our review of military medical literature and discussions with military medical personnel who provided their opinions regarding the uniqueness of military medicine.

Finally, in developing the matter for congressional consideration, we did not envision that DOD would have to provide additional justification for the accession programs. Rather, we believe that the two programs need to be discussed in the context of DOD's specific short- and long-term

requirements for military physicians so that decisions regarding the continued need for the programs and their relative sizes can be made with confidence that the requirements will be adequately met.

Department and University officials offered several technical comments on our draft report that we incorporated into the final report as appropriate.

Objectives, Scope, and Methodology

The National Defense Authorization Act for fiscal year 1995 directed us to submit a detailed report to the Congress on the University. More specifically, the report was to include the following:

- a comparison of the cost of obtaining physicians for the Armed Forces from the University with the cost of obtaining physicians from other sources;
- an assessment of the retention rate needs of the Armed Forces for physicians in relation to the respective retention rates of physicians obtained from the University and physicians obtained from other sources and the factors that contribute to retention rates among military physicians obtained from all sources;
- a review of the quality of the medical education provided at the University with that provided by other sources of military physicians;
- a review of the overall issue of the special needs of military medicine and how these special needs are being met by physicians obtained from the University and physicians obtained from other sources;
- an assessment of the extent to which the University has responded to the 1990 report of DOD's Inspector General including recommendations for resolution of any continuing issues relating to management and internal fiscal controls of the University, including issues relating to the Henry M. Jackson Foundation for the Advancement of Military Medicine identified in the 1990 report; and
- any other recommendations that the Comptroller General considers appropriate.

The methodology for our review is discussed below.

Cost of Obtaining Physicians

Our review of the costs of obtaining physicians for the military focused on the historical educational costs for the graduating class of 1994 and the projected postgraduation costs for additional training (including GME and initial medical readiness training), salary, and retirement costs. In a supplemental analysis, we included a proportional amount of (non-DOD) federal funds provided to civilian medical schools and the University for research and GME programs. We reviewed studies conducted by DOD, the University, GAO, and others on various aspects of medical education costs, including civilian undergraduate and graduate medical education. We held discussions with officials of DOD, the University, and the Association of American Medical Colleges on the relevant cost elements to be included. We included elements that contribute to the cost of obtaining and

retaining physicians and we attempted to ensure comparability between cost elements in the programs.

Detailed Discussion of Cost Methodology

Having determined our base year, unit of analysis, and cost elements, we determined (1) the total cohort associated with the graduating class of 1994 and (2) the percentage of yearly costs to be applied to the cohort.

Tracking the 1994 Cohort

The total cohort included:

- the original members of the class of 1994 that entered in 1991;
- extended matriculations from prior years (5- or 6-year students who were scheduled to graduate with past classes, but who graduated in 1994); and
- student attrition (students who were scheduled to graduate in 1994, but who dropped out of medical school).

We did not include the original members of the graduating class of 1994 who, at the time of our analysis, were expected to graduate in a subsequent class. Under our methodology, the cost of these students would be included in the costs of the class in which they graduate.

The University was able to provide all data needed to determine the total cohort, while the scholarship program officials in the services had varying success. Scholarship program officials were not able to provide useful data on the extended matriculations in the graduating class of 1994. However, they also said that they did not provide additional years of scholarship for 5- or 6-year students. Army officials were not able to provide attrition data by year. Navy officials did not provide any attrition data. We averaged the attrition from the Army and Air Force programs and applied it to the Navy. Table I.1 illustrates the tracking of the 1994 cohort for the University.

Table I.1: Yearly Tracking of Cohort Group Members at the University (Fiscal Years 1989-94)

Starting year	1989	1990	1991	1992	1993	1994	1994 graduates
1989 (6)	1	1	1	1	1	1	1
1990 (5)	•	15	15	15	15	15	15
1991 (4)	•	•	149	142	142	139	139
Yearly 1994 cohort	1	16	165	158	158	155	155
Total students	**660**	**667**	**673**	**648**	**658**	**671**	•

The table shows that the 1994 graduating class at the University had 16 extended matriculations from previous years. Also, 13 members from the original freshman class (162) were excluded because, at the time of our analysis, they were scheduled to graduate in subsequent years. As a result, the start year 1991 shows 149 students instead of 162 students. There were 10 students from the original class of 1994 (start year 1991) who dropped out of medical school altogether. Seven dropped out after the first year and 3 dropped out after the third year.

Scholarship Program Cohort Tracking

Because scholarship program officials were not able to provide meaningful data on the number of 5- or 6-year students who graduated in 1994, the size of the yearly scholarship program cohort was largely determined by the length of the scholarship. Table I.2 illustrates how we tracked the scholarship program cohorts, using the Navy as an example.

Table I.2: Yearly Tracking of Size of Cohort Group, Navy Scholarship Program (Fiscal Years 1991-94)

Award year	1991	1992	1993	1994	1994 graduates
1991 (4)	187	175	175	175	175
1992 (3)	•	149	149	149	149
1993 (2)	•	•	14	14	14
1994 (1)	•	•	•	1	1
Total cohort	**187**	**324**	**338**	**339**	**339**
Total scholarships	**1,350**	**1,206**	**1,273**	**1,348**	•

The table shows that the Navy provided scholarships of 4, 3, 2, and 1 years. For example, a 4-year scholarship started in 1991, while a 3-year scholarship started in 1992. Regardless, these start years led to a 1994 graduating date. We assumed that the Navy scholarship program experienced all of its attrition after the first year.

Yearly Costs to the Cohort

Having determined the size of the cohort in any year that a cohort member was present, we then determined allocation factors to be used to apportion a percentage of each program's yearly educational costs to the cohort. The allocation factors represent the yearly percentage of cohort members to the total number of scholarships or students at the University in any given year. For example, using the Navy table above, 187 members of the 1994 cohort were among the 1,350 scholarships in 1991. The percentage of the Navy's fiscal year 1991 costs applied to the 1994 cohort is represented by the fraction 187/1,350. In fiscal year 1992, the cohort lost

12 students, but gained 149 3-year scholarships. Hence, the percentage of 1992 costs applied to the 1994 cohort is represented by the fraction 324/1,206. We calculated these percentages for each year that a member of the cohort was present in the scholarship program and at the University.

Allocating Cost to the Deferred Program

We allocated the educational and initial readiness training costs to the deferred and regular scholarship programs using a four-step process. We first calculated the individual service's educational and initial readiness training cost for the scholarship program as a unified program. We totaled the service costs and multiplied the total by the ratio of deferred to total scholarship program students and the ratio of regular scholarship program participants to total. This same process was used to determine the initial readiness training costs to be applied to each program, because there was no difference in costs for this training.

Additional Federal Costs to the Scholarship Program

A portion of federal expenditures that support civilian medical education may be incurred to augment the supply of military physicians. Identification of those expenditures, however, is problematic.

The federal government supports civilian medical education in two primary ways. Medicare provides direct and indirect payments to teaching hospitals to defray the costs of resident training. These amounts totaled about $6.2 billion in 1994. The National Institutes of Health (NIH) and other federal agencies provide funding for biomedical research, largely at the undergraduate level. In 1994, NIH provided about $5.7 billion to support research in medical schools. Officials at the AAMC suggested that these monies could be applied directly to medical school programs for the purpose of this analysis.

An apportionment of Medicare GME monies to reflect the funds incurred to augment the supply of military physicians should reflect the fraction of these scholarship students' expected practice lives that will be spent in the military versus the civilian sector. Estimates of the expected length of civilian practice for military physicians is not easily obtainable, especially for University graduates. However, the expected length of military practice is about 5.3 years for deferred scholarship students, 9.8 years for regular scholarship students, and 18.45 years for University students. Lacking the data on expected civilian practice duration, we apportioned Medicare GME monies based on the number of deferred scholarship residents and University graduates who attended civilian GME programs relative to the

total, and on the expected length of their military careers. This apportionment, thus, overstates the Medicare GME expenditures that should be attributed to DOD for preparation of medical students for military service.[35]

Apportionment of the research funding received by medical schools should reflect the expected length of military versus civilian practice. Further, the apportionment should only include those research funds that are directly or indirectly essential to maintaining an effective undergraduate medical education program. Again due to the absence of data on expected practice lives and on the portion of research funds essential to maintaining schools' medical educational program, we apportioned the research monies based on the total number of scholarship students compared with the total number of medical school students for each year from 1991 to 1994, and on the expected length of their military careers. This apportionment also likely overstates the research funding that should be attributed to DOD for preparation of scholarship students for military service.

DOD's Retention Rate Needs

To understand DOD's need for physicians, we interviewed and obtained documentation from the Office of the Assistant Secretary of Defense, Health Affairs, and the Offices of the Surgeons General for each service in order to understand (1) their processes for determining the number and types of physicians required to fulfill their missions and (2) the impact of DOD's downsizing on the physician force levels. As part of this effort, we held additional discussions with officials who were examining some of these issues in PA&E and members of the DOD Roles and Missions Commissions.

To assess how well physicians from the various accession sources served the needs of DOD, we supplemented our discussions with the medical planners in the Offices of the Surgeons General with interviews and data gathered in the Office of the Assistant Secretary of Defense, Health Affairs, and the Defense Data Manpower Center pertaining to the historical retention of physicians by accession source, military service, and medical specialty. The Office of the Assistant Secretary of Defense, Health Affairs, also provided copies of several published and unpublished studies and provided data pertaining to the retention of physicians. The service level

[35]Similarly, in this context, the costs to DOD for preparing University students is overstated, given the fact that University graduates can be expected to spend a portion of their medical careers in civilian practice.

officials that we contacted all agreed that we should use these numbers to discuss the historical and projected retention patterns of DOD physicians.

To examine the factors that influence physicians' decisions to remain in or leave the military, we obtained and reviewed studies from numerous sources dating back to the 1970s. Appendix III is a listing of these studies.

Quality of Medical Education

To determine how the quality of medical education provided by the University compares with that obtained by other military physicians, we identified generally accepted measures of medical education quality through a review of the literature. We also held discussions with and reviewed documentation provided by representatives of the University as well as the accrediting body for U.S. schools of allopathic medicine—LCME—which is a joint activity of the AAMC and the Council on Medical Education of the American Medical Association. We discussed the identified measures with representatives of the Surgeons General of each military service and the Office of the Assistant Secretary of Defense, Health Affairs. Among the measures identified, we assessed the following: the accreditation status of the school, the academic credentials of the students that the school admits, performance on standardized tests, performance upon graduation, and negative indicators of quality.

We also examined documentation provided by the University concerning its accreditation by LCME as well as the Middle States Association of Colleges and Schools, which accredits institutions of higher learning. We met with a representative of LCME to discuss the significance of concerns raised during its most recent accreditation review of the University's School of Medicine and the response of the University to these concerns.

Representatives from the University and LCME said that the academic credentials of the students that a medical school attracts are considered an indirect reflection of the medical school's quality. Two widely used objective measures of academic achievement among medical school applicants are undergraduate GPAs and scores on MCAT. The University provided average MCAT scores and GPAs for University students and for medical students nationwide (access to nationwide records is available to the University as a result of its membership in AAMC). The Army and Navy provided these averages for scholarship program participants, but the Air Force was unable to do so.

We used scores on the USMLE, a standardized test used by all 50 states as part of the physician licensing process, as a basis for comparison of medical education across all U.S. medical schools. The University provided average scores and pass rates for its students and for medical students nationwide for each of the three parts of the test.

To compare how well University graduates and scholarship program graduates perform at the beginning of their medical careers, we examined a sample of performance evaluations completed by supervisors of interns from the University and other schools in military GME programs at the Air Force's Malcolm Grow Medical Center at Andrews Air Force Base, Maryland; the Walter Reed Army Medical Center in Washington, D.C.; and the National Naval Medical Center in Bethesda, Maryland. Because intern performance evaluation procedures vary from program to program, we were not able to examine the performance of interns beyond these three hospitals. The results of our analysis cannot be projected to any other group of interns. We also contacted the commanders of 33 of the largest military medical treatment facilities to obtain their perceptions about the relative clinical performance of University graduates and other military physicians.

Finally, the Armed Forces Institute of Pathology provided information concerning the number of adverse clinical privileging actions occurring among graduates of the University and graduates of other medical schools. The Institute provided the absolute number of actions for each group for the period 1982 through 1994. We combined that information with data about the number of physicians on active duty during that period to determine the number of actions per 1,000 physician staff years.

The officials with whom we met suggested certain other indicators of medical education quality that we did not include in our analysis. For example, University officials suggested that we consider the rate at which University graduates get their first choice among the service's GME programs—a measure favorable to the University whose graduates have a very high first-choice rate. While the Army and Air Force also track this measure, its usefulness is limited in that University graduates receive counseling in choosing a GME program, with the result that they are less likely to make inappropriate choices (that is, to select a GME program for which they are not competitive). Scholarship program participants would not routinely have access to such counseling. Another measure suggested but not included in our analysis is board certification status of University graduates compared with graduates of other medical schools. Although

this measure is important to the services, it may be more reflective of the GME program, rather than the undergraduate program that the physician attends.

Special Needs of Military Medicine

We used several techniques to identify the ways in which military medicine differs from the practice of medicine in a peacetime setting and how military physicians are prepared for these unique aspects of military medicine. We collected information through a literature search and through contacts with and documentation provided by officials throughout DOD including the Office of the Assistant Secretary of Defense, Health Affairs; the Joint Staff; the University; the offices of the Surgeons General for each military service; the DOD Inspector General; training activities throughout DOD; and commanders of some of the largest military medical treatment facilities and selected deployable medical units.

Through discussions with DOD officials, we identified the training required for new military physicians (basic officer training) and the training that most new military physicians initially receive after coming onto active duty (the Combat Casualty Care Course or similar training). Then, working with University officials and representatives of each of these training courses, we compared the medical readiness content of the training that University medical students receive during medical school with that which civilian-educated physicians would have after they complete basic officer training and the Combat Casualty Care Course.

We asked DOD officials to identify measures that would indicate the relative effectiveness of the University program to the approach used to provide medical readiness training to military physicians who are graduates of civilian medical schools. Officials suggested that in the absence of specific measures of physicians' preparedness to meet the special needs of military medicine we consider other indicators such as physician promotion rates, types of assignments held, awards received, and levels of professional military education attained.

We examined but, for several reasons, rejected using these measures in our report. For example, in examining a selection of records, we found that they contained many inaccuracies. In addition, information about the type of assignment held was often ambiguous; thus, it was not clear if a physician was serving in a capacity that was primarily clinical or primarily operational in nature. Using the number of awards received or levels of professional military education attained could unfairly favor University

graduates because many served in the military before they attended the University. Finally, promotion data did not exist in a format that would permit meaningful comparisons.

Because objective evidence is lacking concerning the relative effectiveness of the University approach and other readiness training in preparing physicians for the special needs of military medicine, we sought the perspectives of leaders in military medicine. Through the Joint Staff and the offices of the Surgeons General of each service, we posed questions to the Command Surgeons of each of the unified commands, the commanders of 33 of the largest military medical treatment facilities, and the commanders of 18 of the Army's deployable medical units. In total, we queried 61 commanders, 44 of whom provided their opinions about the University and other military physicians regarding their overall clinical capabilities and their preparedness for the special needs of military medicine.

Responses to Inspector General Recommendations

To determine the progress that the University has made in addressing the recommendations made in 1990 by the DOD Inspector General, we discussed the report, its recommendations, and corrective actions with representatives of the University, the Henry M. Jackson Foundation, and the Inspector General. We also reviewed corrective action documentation that they provided and discussed with representatives of the Inspector General plans for followup to their 1990 report.

Other Contributions of the University

To identify functions of the University other than the medical education it provides its students, we reviewed documentation provided by the University, including correspondence, program descriptions, year-end reports, and other documents. We also interviewed officials at the University, including its President, the Dean of the School of Medicine, department chairs, research office representatives, and various other program officials. We also observed portions of its training program for emergency medical technicians as well as a continuing medical education seminar for physicians. Finally, we sought the opinions of commanders of major military medical units regarding any benefits that they believe derive from the University beyond the medical education it provides.

To identify school functions that are important for educating medical students, we interviewed an official from LCME and reviewed its standards for accreditation.

Comparison of Hours Spent in Initial Medical Readiness Training

As part of its 4-year medical school curriculum, the University provides coverage of many topics related to the special needs of military medicine. Physicians who are graduates of civilian medical school receive such training in basic officer training or the Combat Casualty Care Course (C4). The following table shows the number of classroom hours spent in each area by initial readiness training source. The subjects are grouped into those that are primarily medical and those that are primarily military. Within each of those groupings, the subjects are arranged in descending order according to the amount of coverage that the University provides. As mentioned previously, University students are required to attend the basic officer training for their service branch. Thus, in addition to the amount of coverage that the University provides, for example, 26 hours in medico-legal issues, an Army physician who graduates from the University will receive additional training (12 hours, in this case) by attending basic officer training. (Field training hours for C4 are included within the other subjects shown in the table.)

Table II.1: Comparison of Hours Spent in Initial Medical Readiness Training

Medical subjects	USU	Army basic	Navy basic	Air force basic	C4
Tropical medicine	66.0	0.0	0.0	0.0	0.0
Weapons effects	59.0	0.0	0.0	0.5	0.0
Combat medical skills	41.5	2.0	0.0	7.0	18.5
Nuclear, biological, and chemical warfare	30.0	15.0	0.0	5.5	12.5
Military preventive medicine	26.5	3.0	0.0	0.5	4.5
Advanced trauma life support	26.0	0.0	0.0	0.0	20.0
Military psychiatry	22.5	8.0	2.0	1.0	1.5
Environmental threats	21.5	0.0	0.0	0.0	0.0
Advanced cardiac life support	20.0	0.0	0.0	0.0	0.0
Military disease and injury	18.5	0.0	0.0	0.0	1.5
Special infectious diseases	15.0	0.0	0.0	0.0	0.0
Subtotal	346.5	28.0	2.0	14.5	58.5
Military subjects					
Field training exercise	240.0	81.0	0.0	8.0	0.0
Defense studies and military operations	42.5	11.0	23.0	2.5	1.5
Military field studies	35.0	12.0	0.0	0.0	11.5
Military organization and administration	27.0	10.0	36.0	23.0	10.0
Medico-legal issues	26.0	12.0	10.0	1.0	0.0
History of military operations	17.0	1.0	2.0	1.0	0.0
Subtotal	387.5	127.0	71.0	35.5	23.0
Total	**734.0**	**155.0**	**73.0**	**50.0**	**81.5**

Studies of Factors Affecting Retention of Military Physicians

Cost Effectiveness Analysis of Two Military Physician Procurement Programs: The Scholarship Program and the University Program (GAO/MWD-76-122, May 5, 1976).

Federal Cost of the HPSP Program (GAO/HRD-76-140, June 15, 1976).

Physician Retention and the Cost-Effectiveness of the Uniformed Services University of the Health Sciences; DOD/Office of the Assistant Secretary of Health (Program Analysis and Evaluation) (July 1991).

The Cost of Physicians Accessions; Bircher, J. and Redman, R; Health Studies Task Force, Office of the Assistant Secretary of Defense, Health Affairs (Oct. 1987).

The Cost of Physicians Accessions; Prepared for the Senate Armed Services Committee; Bircher, John; Office of the Assistant Secretary of Defense, Health Affairs (Jan. 1988),

Physician and Dentist Retention; Bircher, John; Health Studies Task Force; Office of the Assistant Secretary of Defense, Health Affairs (Dec. 1986).

Cost Analysis of the Military Medical Care System: Final Report; Institute for Defense Analysis (Sept. 1994).

Military Health Services System Strategic Plan for Graduate Medical Education; Office of the Assistant Secretary of Defense, Health Affairs (Mar. 1994).

Graduate Medical Education Literature Abstracts; GME: A Review of the Literature, Vector Research Inc. (Jan. 3, 1995).

Savings and Costs from Using the "Air Force Model" of GME, Carey, Neal, Center for Naval Analysis (Feb. 8, 1995).

The Cost of Graduate Medical Education, Bircher J., and Ziskind B.; Office of the Assistant Secretary of Health, Health Affairs, Health Studies Task Force (1986).

Graduate Medical Education and Military Medicine, Institute of Medicine (July 1981).

Plan For Improving and Consolidating GME, Office of the Assistant Secretary of Defense, Health Affairs (May 1992).

A Comparison of USUHS School of Medicine Graduate and the Health Profession Scholarship Program Graduate in their First Year of GME: A Descriptive Study, Chagallis, George, dissertation, (Feb. 20, 1984).

Military GME Under Stress: A White Paper, Society of Medical Consultants to the Armed Forces (Oct. 1987).

Fourth Report of the Council on Graduate Medical Education to the Congress and the Secretary, Department of Health and Human Services, Council on Graduate Medical Education (Jan. 1994).

Measuring the Impact of the Navy's Downsizing on Medical Officers Billets Levy, R., and Carey, N.; Center for Naval Analyses (Nov. 18, 1993).

Defense Health Care: Military Physicians Views on Factors Which Influence Their Career Decisions (GAO/T-HRD-89-10, Mar. 16, 1989).

Defense Health Care: Military Physicians' Views on Military Medicine (GAO/HRD-90-1, Mar. 22, 1990).

Retention Rates and Retention Predictors Among Graduates of Army Family Residency Programs; Steinweg, Kenneth K.; " Journal of Military Medicine," Vol. 159 (July 1994), pp. 516-519.

Retention of Internal Medicine Physicians in the U.S. Army; Zaloznik, Arlene; "Journal of Military Medicine," Vol. 159 (July 1994), pp. 520-523).

An Analysis of Factors Affecting The Retention of Medical Officers in the United States Navy, Whalen, William P.; Naval Postgraduate School, (master's thesis) (Dec. 1986)

Correlations of Physician Retention at Tripler Army Medical Center, Thomas, Brennand; U.S. Army War College, master's thesis (Dec. 1991).

Socioeconomic and Personal Variables Effecting Retention of Medical Officers; Cain, Russell L.; Naval Post-Graduate School, master's thesis (Dec. 1986).

Medical Manpower Shortages and the Retention of Navy Physicians; May, L., Graham, A., and Dolfini, J; Center for Naval Analyses (Mar. 1989).

The Impact of the All-Volunteer Force on Physician Procurement and Retention in the Army Medical Department, 1973-1978; Brooke, Paul, U.S. Army War College, master's thesis (June 8, 1979).

Retention of Volunteer Physicians in the U.S. Air Force; Daubert, Victoria L.; RAND Corporation (Feb. 1985).

A Turnover Analysis for Department of Defense Physicians; Gaffney, James K.; Naval Post-Graduate School, master's thesis (Dec. 1986).

A Retention Model for Navy Physicians; McMahon, J.; Center for Naval Analyses (June 1989).

A Multivariate Analysis of Navy Physician Retention; Franco, Richard P.; Naval Post-Graduate School, master's thesis (Dec. 1989).

Retention of Navy Physicians, FY 1984-1988; May, L. and Graham, A.; Center for Naval Analyses (June 1989).

U.S. Air Force Physician Retention; Rodgers, Lee P.; Air War College, master's thesis (Apr. 1990).

Recommendations for Improving the Bureau of Medicine Information System May, L., Graham, A.; and McMahon, J.; Center for Naval Analyses (June 1989).

Procurement and Retention of Navy Physicians Divine, Eugene J.; Center for Naval Analyses (Nov. 1973).

Responses of the Uniformed Services University of the Health Sciences to the Inspector General's Recommendations

The DOD Inspector General (IG) reviewed the University in June and July 1989 to evaluate the adequacy of the University's planning and program execution and to assess the effectiveness of its oversight and management controls. In its April 1990 report, the IG recommended corrective actions in six categories: (1) management and organizational oversight, (2) finance, (3) personnel, (4) acquisition, (5) information resources, and (6) laboratory animal medicine. In October 1994, the IG closed the inspection based on the University's corrective actions reported over a 4-year period. A summary of the IG findings and the response from the University follows.

Management and Organizational Oversight

The IG's report made nine recommendations dealing with the University's management and organizational oversight. These recommendations covered issues involving (1) the need for improvements in internal controls; (2) participation in operational and research projects in foreign countries without formal, written agreements; (3) failure to implement an effective drug testing program; and (4) failure to use commercial entities for services whenever appropriate, in accordance with the Office of Management and Budget's (OMB) Circular A-76.

Internal Controls

The legislation authorizing the University allows the Board of Regents to enter into contracts with the Henry M. Jackson Foundation, a congressionally established not-for-profit organization for the advancement of military medicine. The legislation allows the Board to furnish the services of professional, technical, or clerical personnel and to make University facilities, equipment, space, and support services available to the Jackson Foundation. The IG found that the University had assigned personnel to perform the same work for the Jackson Foundation as they did for the University. By doing so, the University created an appearance of a conflict of interest and eliminated essential internal controls governing the separation of authority, duty, and responsibility.

For example, the president of the University, at the time of the IG inspection, was a director and served as the secretary and treasurer of the Jackson Foundation. As the University president, he had the responsibility and authority to manage and control all University resources, including research programs, and to oversee the administrative functions. At the Jackson Foundation, he directed the day-to-day business and entered into contracts, leases, and cooperative agreements.

According to the IG, the University is subject to DOD's internal management control program, which is designed to provide necessary controls over the accountability and utilization of DOD resources to prevent instances of fraud, waste, and abuse. The University was required to evaluate its internal controls and rate identified assessable units from high- to low-risk vulnerability. In the assessment done in 1986, the University found no weaknesses, and all units were rated low-risk. This occurred again in 1988, shortly before the IG's inspection. The IG could find no documentation to indicate that the internal management control systems were tested in several critical functional areas, such as logistics; contracting; the care, treatment, and security of animals used in training and research; and pharmaceutical management.

In December 1990, DOD issued a policy statement on the support and resources shared between the University and the Jackson Foundation. In 1991, a general operating agreement and several subagreements between the University and the Jackson Foundation were signed. However, support provided by the University to the Foundation or by the Foundation to the University in the same functional area require separate subagreements. Billing schedules are quarterly and are paid in full. Additionally, 34 Jackson Foundation administration positions were reviewed and 7 converted to federal civil service.

The Naval Academy's internal control system was used to shape a similar system for the University, an internal control plan for implementation of the Federal Manager's Financial Integrity Act was established, and mid- and long-range plans were developed.

International Agreements

Under Public Law 92-426 as amended, the Board may enter into agreements with foreign military medical schools for reciprocal education programs. The procedures to establish an agreement for student exchange or a joint research program begin with informal discussions between the University and foreign country representatives. A formal agreement is prepared by the University's General Counsel and is approved by the Board. The agreement is then coordinated through the Deputy Director for International Affairs; the Office of the Assistant Secretary of Defense, Health Affairs; and DOD's General Counsel. The Secretary of Defense signs the agreement after completion of the coordination.

The IG found that the University was actively engaged in research projects in countries that had no existing DOD-approved agreements. Agreements

with Belize, Pakistan, and the People's Republic of China had been in the coordination phase at the Office of the Secretary of Defense for up to 2 years at the time of the IG inspection. University medical researchers regarded these delays as a reason to begin work on their projects without waiting for approval. They were managing these projects based solely on informal arrangements. The President of the University approved and supported these projects with DOD resources. The Board had the responsibility to consider the ramifications of conducting operations in a foreign country without a formal agreement.

The University subsequently established procedures to comply with DOD requirements. The new procedures provide that no government resources be committed until an approved agreement is signed. The approval process requires the University's General Counsel to collect and assemble the agreement package and provide simultaneous copies to the Office of the Assistant Secretary of Defense, Health Affairs, and DOD's General Counsel. The University's Board of Regents requires that all proposed international agreements be provided to the Board before the start of negotiations and again once negotiations have been completed, but before implementation.

The University also entered into memoranda of understanding with the governments of Belize and Pakistan. The University determined that its activities in Zambia were adequately covered by specific contracts. No agreement was concluded with China and no operations or resources were committed there. According to a University official, the University currently has agreements with Canada, Denmark, Pakistan, the United Kingdom, and Israel.

Drug Testing

Programs to ensure a drug-free work place are required by DOD for the safety, health, and productivity of its employees and the public they serve. The Secretary of Defense directed each of the services to develop drug abuse prevention and control programs.

The University, as part of the DOD medical community, should place special emphasis on drug programs. The IG, however, found that an inadequate number of military personnel assigned to the University had been tested for drugs. As a result, the University updated its procedures for the drug testing of all military personnel assigned to it, with the goal of testing 100 percent of the military personnel at least once a year. The implemented instructions contain internal control provisions that assure

appropriate action is taken by the University or the military services when a drug test proves positive.

In April 1990, the University also implemented procedures for the drug testing of certain civilian employees (Chairman, Board of Regents members, all persons with top secret security clearances, motor vehicle operators, and faculty members who handle or manage controlled drugs). Currently, 194 civilians are subject to drug testing out of an employee work force of approximately 800.

OMB Circular A-76

OMB Circular A-76 requires reliance on commercially available sources to provide products and services that the government needs. DOD supports the policy through its commercial activities program. DOD components have been directed to implement the program, designate a program office, complete an inventory of all commercial functions, and report program data to the Under Secretary of Defense for Acquisition.

The IG found, however, that the University's inventory of commercial activities included data on activities such as medical and dental equipment; research and development support; data processing services; training support; and the maintenance, repair and alteration of real property, but excluded other functions such as printing and reproduction, audiovisual, and library services. Further, the University did not have a special program office to ensure that the program was carried out.

In response to the IG's finding, the University implemented commercial activities program procedures and contacted the A-76 representative for the National Naval Medical Center to coordinate all program matters. The University updated its inventory of commercial functions and added printing and reproduction, audiovisual, and library services. In compliance with DOD instructions, the commercial activities inventory report has been submitted to the Assistant Secretary of Defense, Production and Logistics. The report included a schedule for cost analysis of those functions subject to the program.

Finance

Three federal appropriations are the major sources of funding for the University: operation and maintenance; research, development, testing, and evaluation; and procurement. The University also receives reimbursements for research projects in the form of grants or contracts. The IG's review found that the University did not have an organizational

master plan that describes the University's methodology for achieving its mid- and long-range mission objectives and requirements. The purpose of such a master plan is to establish a logical path toward accomplishing the mission, set mission priorities, and provide reasonable justification for resources.

The IG's review showed that the University's budget proposals were generally straight-lined from one year to the next. The only notable changes were the effects of inflation. Because no master plan existed, University department heads independently determined the requirements needed for their operations and projects and submitted them to the financial management directorate. The submissions were approved by the Board and provided to DOD's Comptroller for inclusion in the DOD budget.

The IG's review also showed that the University had not validated personnel requirements with DOD. DOD requires its components to manage, provide resources, and evaluate activities based on output performance requirements and standards documented in performance statements. The University's 1989 budget request identified $24.8 million for civilian personnel or 67 percent of the University's annual appropriated budget. (Military personnel were included in the respective service budgets.) No personnel baseline was identified from which to establish resource requirements, nor could changes in work load be tracked. Personnel requirements were based on comparisons with civilian medical schools or general functional duties instead of performance requirements or work load analysis of actual duties.

The IG found that University funds are allocated based on judgments of what programs were considered important at the moment rather than on an established plan. For example, the then University president decided to divert funds to increase support to the Jackson Foundation to prevent the financial ruin of the Foundation. The IG found that the amount of the diversion was not determined analytically based on accurate cost data, and no complete, accurate analysis of the impact of the transfer of funds was made.

Other than quarterly meetings of the University Board, the IG found no established budget review procedures. The IG concluded that the Board did not conduct in-depth reviews of mission performance or budget execution. The University had no systematic measurement of progress to ensure that resources were being applied to mission requirements, as requested in original budget proposals.

Through a questionnaire distributed to its staff, the University conducted a personnel study that was completed in January 1991, and validated by an independent contractor. The survey justified 867 civilians, 309 uniformed personnel, and 173 Jackson Foundation employees to work in direct support of the University's mission. A Table of Distribution and Allowances was developed for each of 78 administrative work centers identified in the study and its validation.

The Board of Regents formed a Planning Committee to administer the development of mid- and long-range master plans. A strategic planning group developed a strategic plan that was issued in December 1993, based on the results of accreditation self-studies. This plan is to be updated as conditions warrant.

The University requested DOD approval of the College and University Finance System as the University's accounting system. The Defense Finance and Accounting System reviewed the system in February 1992, and approved its use for reporting purposes under the Federal Managers Financial Integrity Act.

Personnel Management

The Inspector General's report made seven recommendations dealing with the University's personnel system. These recommendations covered issues involving (1) classification and position management, (2) merit promotion, (3) equal employment opportunities, (4) training programs, and (5) federal and state income tax.

Classification, Position Management, and Merit Promotion

Federal personnel law requires that in determining the rate of basic pay the principle of equal pay for substantially equal work be followed. The University published internal instructions to support federal personnel law, directing each supervisor to certify the accuracy of positions on a yearly basis and to prepare evaluation statements for supervisory positions. The IG's review found that the University was not complying with either the intent of the federal law or its own instructions. For example, the IG's review included a random sample of 50 position description and evaluation statement documents and found that there was either no evaluation statement or the documentation did not properly support the grade of supervisory positions. In two instances, an evaluation statement that supported a lower grade was attached to a position description as supporting documentation. In 17 other instances there was no evaluation statement for positions in a mixed general schedule grade

series. Without evaluation statements, there was no rationale to explain how the grade levels were determined.

Seven of the 50 position descriptions that the IG examined had the same duties and responsibilities but were classified at different grade levels. Through comparison of University positions with the DOD Average Grade Statistics, the IG concluded that misclassification of positions was a systemic problem at the University. For example, the University had two positions for GM-341, Administrative Officer, classified at the GS-14 level that were comparable to the DOD average grade level of GS-11 for the same position.

The IG also found that the University had failed to support and implement basic merit promotion procedures for filling positions. According to the IG, the practice of noncompetitive promotions was commonplace at the University, with the following types of violations identified:

- adding duties to positions with known promotion potential and promoting the incumbent without competition,
- noncompetitive promotion from one job series into a different series,
- managers preselecting individuals for promotion by memorandum or notation on the personnel action form,
- reassignment of unqualified employees into key positions with promotion potential, and
- failure to properly document promotion actions.

The Office of the Secretary of Defense and the Office of Management and Budget conducted an evaluation of the University civilian personnel program and, as a result, delegated the personnel appointing and position classification authority to the Washington Headquarters Service which developed a detailed plan of action for correcting the deficiencies. Data pertaining to alleged prohibited personnel practices were collected by the University and the Washington Headquarters Service. The IG determined that the University took appropriate actions, which included replacing the president, vice-president of operations, and civilian personnel officer. A 100-percent position reclassification or restructuring was conducted, which resulted in savings of about $200,000.

The University implemented internal control procedures and established standard operating procedures for civilian resource management. The University also established instructions for the completion and approval of

requests for personnel actions and for the merit promotion and placement program .

Equal Employment Opportunities

The IG identified three equal employment opportunity (EEO) violations at the University:

- the EEO responsibilities were not included in position descriptions of individuals assigned EEO responsibilities;
- of 80 University supervisors, 25 did not have EEO has a critical element in their performance standards; and
- pictures of EEO representatives were not displayed on any public bulletin board.

EEO responsibilities were incorporated in all appropriate position descriptions when classification audits were done as part of the 100-percent reclassification review. An Equal Employment Officer began work in July 1991, and a University EEO instruction was implemented in May 1993.

Training Program

In its review of the chief personnel officer's activities, the IG found a lack of oversight and improper management of the University's training program. Employees did not receive the training required to satisfactorily perform their jobs, such as mandatory training for contracting officers. Supervisors and managers were not fulfilling their obligations to manage training dollars and improve the management of staff resources.

An experienced employee development specialist was appointed in August 1991 and was charged with developing a functional program to meet or exceed legal and regulatory requirements. The University now requires an individual development plan for all employees in formal training programs. All others must be supported by an individual development plan or a written department or office training plan.

Federal and State Income Tax

The IG found that the University had not established procedures to ensure the collection of federal and state income taxes from foreign exchange students and recommended that the University review all records pertaining to the Exchange-Visitor program to correct tax withholding discrepancies. The IG also recommended that the University develop

written procedures and policies to ensure administrative controls and oversight of the program.

A University standard operating procedure was finalized in February 1990. All affected employees who were on board at the time of the IG's review were contacted and all required tax forms were completed.

Acquisition

The IG focused its review on issues relating to the University's implementation of standard DOD logistics support methods and compliance with the Federal Acquisition Regulations and the Defense Federal Acquisition Regulation Supplement. The IG made nine recommendations involving six issues: (1) contracting and auditing procedures, (2) logistical support, (3) property management and accountability, (4) controlled items and substances, (5) records management, and (6) cafeteria operations.

Contracting and Auditing Procedures

The IG found that the University was awarding contracts without field pricing. The purpose of field pricing is to give the contracting officer a detailed analysis of a proposal for use in contract negotiations, such as providing the basis for price determination. For example, an $8.9 million contract was awarded on the last day of fiscal year 1988 but the contract proposal was not received until November of 1988. The contract amount on the proposal was $8.8 million. According to the IG, this contract was awarded on the basis of available funds rather than on contracting principles.

Another purpose for field pricing is to establish indirect cost rates for the negotiation process. Without field pricing, the contracting officer had to rely on previous indirect cost rates that were based on a lower volume of sales by the contractor (the higher the sales volume, the lower the indirect cost rate for a particular contract). The IG found that field pricing may have saved the University over $200,000 on the $8.9 million contract.

Under the Office of Management and Budget guidelines for nonprofit organizations doing business with federal agencies, the agency with the largest dollar value of awards will be the cognizant audit agency for the negotiation and approval of indirect cost rates. The assignment will not be changed unless there is a major long-term shift in the dollar volume of the federal awards to the organization. At the time of the IG's review, the cognizant audit agency for the Jackson Foundation was the Department of Health and Human Services. However, a 1989 award from DOD had resulted

in a major long-term shift in the dollar volume of Jackson awards from the Department of Health and Human Services to DOD. According to the IG, the University should have requested that DOD assume audit responsibility for the Jackson Foundation but had not made such a request to DOD.

Since June 1990, the Contracting Division has experienced 100-percent turnover in personnel. All new contract division personnel have been made aware of the requirements of the Federal Acquisition Regulations, with respect to field pricing support. The Contracts Division has implemented DOD procedures for documenting contract negotiations for awards exceeding $100,000. Contracts division personnel have received mandatory training funded through the DOD Acquisition Enhancement program.

Upon urging from the University, the Defense Contract Audit Agency agreed to assume audit responsibility for the Jackson Foundation. In 1991, the Defense Contract Audit Agency informed the Jackson Foundation that it had full audit cognizance for contracts for fiscal year 1989 and forward.

Logistics Support

According to the IG, the University had failed to use the Defense Asynchronous Message Entry System for its procurements, which resulted in duplicated efforts in the requisition process. The System permits the University to submit machine-processible requisitions to the Defense Automated Addressing System Office, which then transmits the requisitions to the appropriate federal supply source. Instead, the University relied on a manual system to requisition items stocked by the Defense Logistics Agency or the General Services Administration. The requisitions were mailed to those activities, where they were input into automated logistics systems. According to the IG, if the University had used the Defense Asynchronous Message Entry System only one transaction would have been needed, and the margin of error would have decreased because of built-in quality checks.

In November 1989, the Defense Asynchronous Message Entry System was fully implemented by the University and is being used for placing all Defense Logistics Agency and General Services Administration orders, as well as receiving on-line status of requisitions.

Property Management and Accountability

The University's Logistics Division was responsible for administering and directing the property management program. The program includes

warehousing of all equipment and furniture assigned to the University and receiving, identifying, delivering, and controlling all property entering or leaving the University. The IG found that the University did not use effective warehousing practices. Property was stored in a parking garage and was vulnerable to waste, loss, unauthorized use, damage, and theft. Property stored in this area was secured by a ceiling to floor chain-link fence with two entries locked with standard padlocks.

In March 1989, an inventory of the University property identified about $471,000 worth of property that was unaccounted for or lost. The University's vice-president of operations directed that all property items valued at less than $500 and not accounted for be deleted from the records without further investigation. This property was valued at about $138,000.

A new storage building was built and all accountable property moved into it. The University has issued personal property reporting and disposal procedures and developed an 83-element property management checklist. The University also developed a property custodian guide and procedures for accounting for lost, damaged, or destroyed property. All property custodians were trained by January 1992. During biannual inventories, all property custodians are briefed before beginning their inventory and new custodians are given a property custodian briefing.

Controlled Items and Substances

The University pharmacy is located in the Department of Laboratory Animal Medicine and is responsible for the procurement and management of controlled and noncontrolled pharmaceutical items required to support the University's teaching and research mission. The IG found that the University violated security requirements for controlled items, promulgated by DOD. One of the basic security measures required is a limited access area defined by a barrier extending from floor to ceiling. Hypodermic syringes and needles were stored on shelves and carts in the back of the self-service store. All employees of the store had access to the storage area.

The University supplements the DOD directives with standard operating procedures including detailed security procedures for the pharmacy safe. The IG found however that, with few exceptions, the security procedures were not followed during a test period. Further, in 19 instances the same person initialed opening, closing, and checking the safe.

More specifically, the IG found that the pharmacy officer did not maintain a complete and accurate inventory of all controlled substances as required by University regulation. Further, the IG stated that the University's failure to adhere to established controls over the inventory resulted in inaccurate inventory balances, loss of accountability, over- or underprocurement of supplies, and the opportunity for theft or misuse.

In June 1991, the University issued procedures that implement previous University and DOD instructions and federal regulations. Also, unannounced reviews are made at least three times a month to ensure that logs to record opening and closing of the pharmacy safe are completed and that departments receive monthly controlled substance reports.

Records Management

DOD has established a records management program that identifies responsibility for the life cycle management of records from creation through maintenance, use, and disposition. The IG found that the University had no procedures for a centralized records management system: each office kept its inactive files either with current files or in storage areas that had not been designated as records holding areas. In areas inspected, there were boxes of records that were undated, not labeled, and opened with files in disarray; boxes were thrown together and haphazardly stacked; and some had water damage while others were crushed.

The University has implemented the DOD Records Management Program and used the Records Management Division, Washington Headquarters Services, to train University personnel in records management. Training was completed in May 1991. IG followup found that all offices were in compliance with University procedures. Schedules for scientific, research, and educational records have been approved by the National Archives.

Cafeteria Operations

The IG's review of University food service personnel records showed that the employees did not have certificates or documentation to indicate that they had received the required initial and refresher training in food service sanitation principles. Additionally, the IG found that only 5 of 30 required bimonthly inspections had been conducted by the University from October 1987 to June 1989.

The IG requested to see the food handler cards of the cafeteria employees; only 2 of the 11 employees could produce their cards. Further, 7 of the

employees did not have physical examinations before their initial assignment. One of these employees had tested positive for tuberculosis.

All current employees have been issued food handler cards by the Occupational Health/Preventive Medicine Department, National Naval Medical Center, and all new employees are required to obtain food handler cards. All full-time employees also have completed food service training sponsored by the Bureau of Medicine and Surgery.

Information Resources

The information resources at the University consist of automated information created and maintained for day-to-day operations and to meet reporting requirements and information collected from and disseminated to public sources. The University Computer Center is responsible for implementing life-cycle management controls, approving hardware and software purchases, and maintaining an accurate inventory and records of accountability.

The IG found that the University had not followed DOD life-cycle management procedures in the development, acquisition, and management of automated data processing systems and resources. Specifically, the University did not complete the definition and design phase for the automated financial system, the College and University Finance and Accounting System. The University had not defined the performance factors necessary for the operation and assessment of the financial system. System objectives such as performance, size and complexity of transactions, response times, types and formats of reports, and internal controls were not documented. Because the University did not establish system objectives and performance factors, it had no means to accurately evaluate the system's efficiency, functional performance, and benefits to the organization.

The IG found no written procedures to establish the University Computer Center's responsibility for reviewing and approving all automated data processing procurements. The lack of written procedures prevented enforcement of the University Computer Center's responsibilities, which resulted in circumvention of the life-cycle management process and unapproved purchases. The University's instructions covering automated information systems were reviewed and found to provide adequate policy guidance for most life-cycle management procedures. This policy statement was rewritten in June 1993. Internal policies have been implemented for the processing of systems development and maintenance

requests. Acquisitions of all automated data processing equipment and software are reviewed before purchasing and small system decision papers are required for all microcomputer purchases.

An information resources management plan has been prepared with 5-year costs and alternatives for all projected information resources management initiatives. These initiatives have integrated the needs of the departments with those of the University as a whole.

The University established the Air Force Accounting System as the baseline to evaluate the College and University Financial System for efficiency, functional performance, and benefits to the organization. A Defense Finance and Accounting Service evaluation of the system found that it is in compliance with GAO, Office of Management and Budget, and DOD requirements. In April 1992, procedures were established and implemented in the College and University Financial System to record all transactions associated with the Jackson Foundation cooperative agreements.

Laboratory and Animal Medicine

The Laboratory Animal Medicine Department provides the University with animals for teaching and research, develops and implements policy for care of the animals, and maintains a professional and technical staff for veterinary medical care. The IG found the University's animal facilities extremely clean and well ventilated and lighted. However, the IG found some problems covering record keeping, security, and protocol reviews.

Animal Research Records

The IG found that animal records were not adequately maintained and that there was no system for quality control. The University has issued directives that require documentation of all animal related activity, including information on the general condition of the animals. The purpose of this information is to provide a history of teaching and research projects and documented evidence to validate the outcome of the projects. The IG also found a breakdown in management controls over recording transactions for controlled substances. Controlled substances are used as anesthetic agents to prevent pain and suffering of the animals during animal surgery and research analysis.

Corrective actions and a quality control system have been implemented to ensure cage or animal numbers are included on the records. Procedures have been implemented to ensure copies of the anesthesia records are

filed in the appropriate animal's health record. A quality assurance system for animal records, consisting of an 89-item record audit checklist and 8 to 10 audits per month, has been implemented.

Laboratory Security

The security of the facilities housing the animals that the University uses in teaching and research programs is paramount to the safety of the animals and the integrity of the research programs. The University's security system consists of a number of locked doors that can only be opened by access cards. The cards are programmed to allow entry only into certain areas and only during certain hours.

The IG found that 37 percent more cards had been issued than needed for the number of people conducting research with animals. The University did not have written guidelines for issuing the cards or an accurate inventory of the access cards.

The University developed written instructions that were issued to each individual when they were issued an access card. A random spot-check of card holders entering the animal facility is conducted, then cross-referenced against the issued card inventory. Should a discrepancy be noted, it is investigated and resolved by the central animal facility security officer. All excess cards that have not been issued are stored in a combination safe with a current inventory list.

Animal Review Board

The University established the Laboratory Animal Review Board to carry out DOD requirements. The board reviews research and teaching protocols using animals, recommends approval or disapproval, and conducts periodic inspections of animal facilities. The IG found that the review board had inadequately managed animal research protocol reviews.

The review board used a research protocol review request log to keep track of the review and approval process. An IG comparison of the log with the original research proposal showed that in 50 percent of the cases examined the original proposal document did not have a signature to match the reviewer shown on the log. Also, the IG found that none of the original research documents examined was reviewed by all nine review board members; at most four members had signed as reviewers. In one instance, the chairman of the board was the originator of the proposal and was the only member to approve the protocol.

Procedures have been instituted requiring reviewers to submit signed review sheets with their comments recommending approval or disapproval. The final decision on proposals will be determined by a quorum of members at the review committee meeting, and the chairman will not be the signing authority for proposals on which he or she is the principal or participating investigator.

Ordering Information

The first copy of each GAO report and testimony is free. Additional copies are $2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

Orders by mail:

U.S. General Accounting Office
P.O. Box 6015
Gaithersburg, MD 20884-6015

or visit:

Room 1100
700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC

Orders may also be placed by calling (202) 512-6000
or by using fax number (301) 258-4066, or TDD (301) 413-0006.

Each day, GAO issues a list of newly available reports and testimony. To receive facsimile copies of the daily list or any list from the past 30 days, please call (301) 258-4097 using a touchtone phone. A recorded menu will provide information on how to obtain these lists.

For information on how to access GAO reports on the INTERNET, send an e-mail message with "info" in the body to:

info@www.gao.gov

PRINTED ON RECYCLED PAPER

United States
General Accounting Office
Washington, D.C. 20548-0001

Bulk Rate
Postage & Fees Paid
GAO
Permit No. G100

Official Business
Penalty for Private Use $300

Address Correction Requested

BEST COPY AVAILABLE